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STEAM NAVIGATION, COMMERCE, FINANCE,

INSURANCE, BANKING, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

SATURDAY, MAY 14, 1859.

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PUBLISHED WEEKLY, BY

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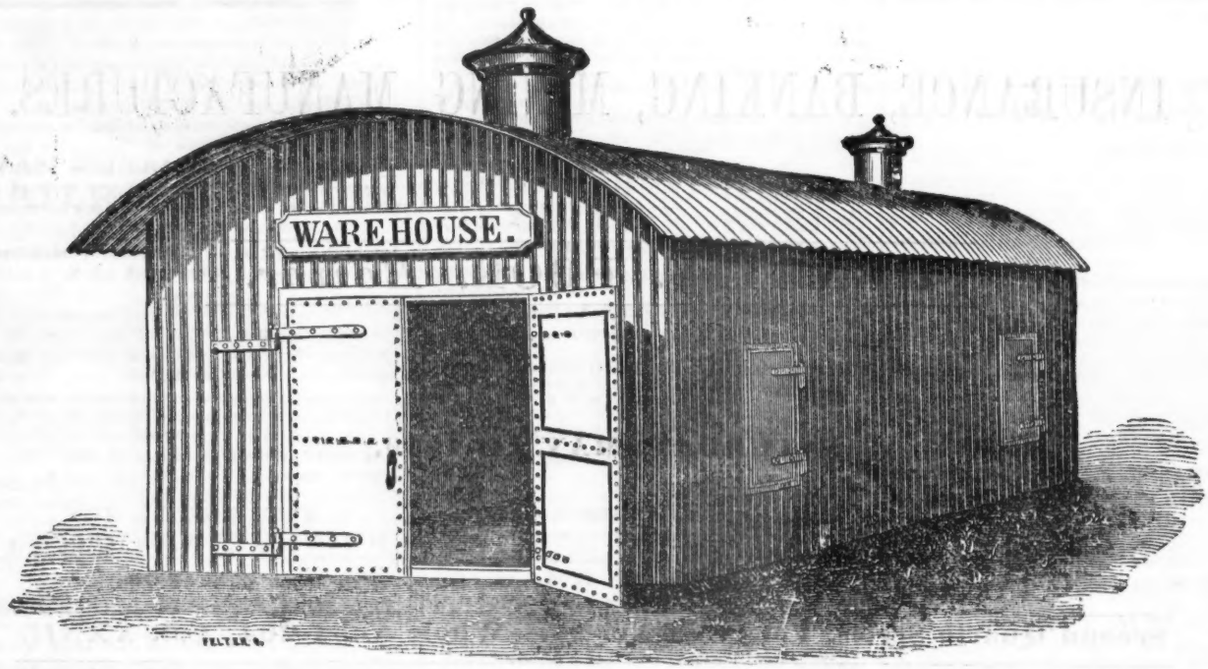

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO. No. 9 SPRUCE ST.

New York, Saturday, May 14, 1859.

☞ See "Sale of Rolling Mill" advertisement on page 316.

The Grand Falls Bridge.

We give below from the London *Engineer*, an interesting description of a bridge over the River St. John, which fell in the early part of the winter, from the parting of the cables, or chains, which supported the truss:

I beg leave to forward to you a description of the new bridge over the Grand Falls of the river St. John, in this province, on the mail road between this city and Quebec, and an account of its destruction on the 18th inst., deeming the design to have some points of originality and novelty worthy of a better fate than has attended it.

The river St. John, the third river in point of importance in British America, rises in the north of the State of Maine, runs in a north-easterly direction to its confluence with the St. Francis, and from this point, turning southward, forms for over seventy miles the international boundary between the State of Maine and the province of New Brunswick. About three miles above the Grand Falls it enters this province, and runs almost due south 235 miles, to the harbor and city of St. John, where it finally empties itself into the Bay of Fundy. It is navigable at all seasons, when not obstructed by ice, to Fredericton, the capital, eighty-five miles above the mouth, and in the spring and autumn months light draft steamers run 140 miles further, to the Grand Falls; above which it is again navigable for seventy miles in one direction, and in another sixty miles, to within thirty-five miles of the St. Lawrence.

The Falls themselves, though inferior in volume of water, are not surpassed in magnificence and wild picturesque grandeur by any cataract in North America. The total descent from the upper to the lower basin, only half a mile apart in a direct line, but nearly three by the river, is 140 ft., of which 75 feet is accomplished in the first perpendicular leap, and the remainder in a series of rapids and falls, in the narrow rocky gorge below. The place selected as the best site for the bridge, was immediately over the second fall, about seventy yards below the principal one, and where the rocks approach to within 190 ft. of each other. The depth to the water from the top is about 120 ft. on the west side, and nearly 80 feet on the east, which presented, however, an excellent bed of stone for building purposes, and a firm ledge of rock on which to found an abutment.

In designing the long span over the river, the impossibility of obtaining any support, however temporary, on which to rest the superstructure during the progress of the works, and the difficulty of access to the eastern side of the river, rendered any of the usual forms of truss bridges out of the question, whilst the total span to the east bank was beyond the limits of anything but a suspension bridge, which in this locality was deemed inadmissable. The reasons given against the employment of a suspension bridge, were founded principally upon the peculiar position of the structure, hanging immediately over the spray of the Falls, where every wire and rod would form the nucleus for a deposition of ice to an extent that in England cannot be appreciated, but calculated to add a destructive weight to the bridge during the five months' winter of this extremely cold locality. The contraction and expansion of the back cables doubling the length of the actual bridge, is also a serious objection in a climate where the temperature, for five months in the winter, ranges from —40 deg. to +40 deg., and in summer often runs up to over 120 deg. For these reasons, and in addition the growing disfavor of suspension bridges, due to the many serious accidents that have occurred, decided the Commissioners of Public Works to adopt the plan submitted to them by Mr. Tomlinson, a bridge builder of notoriety in these provinces, for a tension bar bridge of a somewhat novel construction.

The principal point of originality claimed, is the combination of a trussed superstructure, supported at intervals of 21 feet, by frames screwed at the bottom to two main chains passed underneath between the abutments, and anchored at each end to the truss work itself. The superstructure and roadway are consequently analogous to the top chord of an ordinary framed bridge, or the cellular top of the Britannia tubes, being wholly under compression, whilst the chain represents the bottom plates of the one, or the lower chord of the other, the strain being entirely tensile. At the Grand Falls, as put up, each of the main chains consisted of four bars of hammered iron, 4×¾ near the abutments, and 4×⅝ in the middle, the least sectional area of each being 10 square in. in the centre, and 12 in. in area near the abutments, the length of the bars varying from 21 ft. to 22 ft. 6 in., with round eyes forged at each end, and connected by turned 2¼ bolts. Each of these bolts carried a cast-iron shoe, into which the foot of an upright post, 8×8 in the middle, and 7×7 near the abutments, was properly secured, and these posts of pine timber, tied and framed together, supported an ordinary truss bridge, at intervals of about 21 feet. This truss had a camber of 5 ft. in the middle, and the versed size of the chains in the centre being 15 ft., the supporting frames or bents, varied from 20 ft. in height to about 6 ft. for the first pair near the abutments. The extreme span was 194 ft., and to guard against the injurious effect of the accumulation of packed snow and ice that collects on the roadway of bridges during the long winter, the clear breadth between the truss work was only 15 ft., every part of the exposed woodwork being so arranged as to show as little available surface as possible for the snow to rest upon. At the time of the accident, not over one foot of snow could have been deposited, and the most liberal calculation of weight would not be over 20 tons, equally distributed over the whole length.

The bridge was completed and opened for traffic on the 1st inst., and in the morning of the 18th both main chains broke at each end, apparently at the same instant, within 5 ft. of the abutments, and the whole superstructure fell bodily, a pair of horses and two men being precipitated into the gorge beneath, a depth of over 120 feet. The accident happened about 7 A. M., the thermometer being 30 deg. below zero. The bridge gave some slight notice, as the men who were walking behind the sledge turned round and attempted to run towards the shore they had left, whilst the horses sprung into a gallop towards the opposite side. They all, however, fell with the bridge, the men clinging to the truss work till, their end of the framework striking a projecting rock, they were violently hurled forward, but still prevented by the trussed handrail from being washed off the planking. In this position they were found some hours afterwards, but, though alive, were too much injured to survive over a few hours; the men who assisted in their recovery being

themselves dangerously frozen in their philanthropic attempt. The horses were thrown by the concussion into the water, passed over the Falls, and were seen no more.

The apparent cause of the breakage is defective iron, the bars that broke showing a fracture without any appearance of fibre, and being cold-short and brittle, as if burnt in the workmanship; and short pieces of the bars are lying upon the rocks in pieces of a foot long, as if each had given way in different places at the same moment. As the bridge had been severely tested, the insistent weight at the time of the accident will not account for the effect produced, and the additional strain due to the intense cold must have been the proximate cause.

A prejudice against this description of bridge will very probably prevent others being built on the same design; but that the principle may be applied elsewhere, and that with some modifications, and perhaps stronger iron work, the details are generally correct, the experience of this bridge before the accident abundantly proved. The total cost of the 194 ft. span, exclusive of masonry, was under £2,000.

The specification, bills of timber and iron, (excepting the chains, which were enlarged subsequently,) were printed in the last report of the Board of Works, pp. 33, 54 to 70, a copy of which I sent you last mail. I trust that the above particulars may have an interest in England.

S. T. Vernon Smith,
Engineer to the Board of Works, Province of New Brunswick.

St. John's, Dec. 27th, 1858.

Bellefontaine Railroad Line.

We have received the Third Joint Annual Report of the directors of the roads composing this "Line," viz: the *Bellefontaine and Indiana*, and the *Indianapolis, Pittsburg and Cleveland*—being the Ninth Annual Report of the former, and the Tenth of the latter company. The former extends from Indianapolis to Union, 84 miles; and the latter from Union to Crestline, 122 miles—making the entire length of the joint roads 206 miles. The business of each road for the fiscal year ending December 31st, 1858, was as follows:

BELLEFONTAINE AND INDIANA RAILROAD.

Earnings.

	Passengers.	Freights.	Mail, etc.	Total.
Jan. .	$6,429.20	$14,791.19	$1,978.38	$23,198.57
Feb. .	6,002.05	14,647.00	1,978.38	22,627.23
March	10,556.26	20,807.55	1,978.38	33,341.99
Ap'l .	11,393.39	18,219.14	2,100.85	31,713.38
May .	9,578.50	10,834.55	1,978.18	22,391.03
June.	9,003.00	10,613.04	1,978.38	21,594.22
July .	8,143.95	10,951.08	2,081.31	21,176.34
Aug..	10,675.39	18,611.75	2,135.91	31,423.05
Sept.	12,388.33	18,693.53	2,188.30	33,270.16
Oct. .	12,059.73	21,537.91	2,188.30	35,785.94
Nov..	9,499.22	18,954.67	2,188.30	30,642.19
Dec. .	8,834.98	13,864.12	2,363.50	25,062.60
Tot.	$144,564.00	192,525.53	25,137.17	332,226.70

Expenses.

Repairs of engines	$23,750 41	
" cars	13,588 76	
" track	35,519 95	
" build'gs, bridg's, etc.	2,314 15	
Train expenses	25,158 66	
Depot and station expenses	16,525 85	
Wood	22,146 77	
Oil and waste	5,851 36	
Salaries	6,263 56	
Miscellaneous	34,294 77	
		185,414 24
Net earnings		$146,812 45
Interest on bonds	$90,328 00	
Taxes	8,262 11	
		98,590 11
Balance		$48,222 35

Compared with the previous year, the expenses show a decrease of $42,101 35
The gross earnings a decrease of 16,125 13

The net earnings an increase of $25,976 22

CONDENSED BALANCE SHEET.

		Dr.
Capital stock		$1,874,370 61
First mort. 7 per ct. bonds, due 1866		791,000 00
Second " " " " 1870		140,000 00
Income " " " 1859		199,500 00
Real estate bonds original " 1858		1,000 00
" extension " 1861		40,000 00
" " " 1863		40,000 00
" " " 1866		48,000 00
Div. scrip to be funded in 2d mortg. bonds		15,328 09
Bills payable		2,678 09
Car loan		11,737 29
Unpaid interest on bonds		24,613 11
Surplus earnings prior to 1858		85,242 11
Net earnings of 1858		146,712 46
		$3,370,281 67

		Cr.
Cost of road and equipment		$3,008,919 29
Real estate		84,375 08
Materials and fuel on hand		36,969 26
200 shares C. P. and I. stock		10,000 00
One bond of Marion Co., O.		1,000 00
Interest on bonds for 1858		90,328 00
Taxes paid in 1858		4,278 30
Suspense account		5,854 20
Cash and notes in hands of Real Estate Trustees	$75,534 98	
Bills receivable	42,261 88	
Due from Ex. Com.	9,711 35	
Cash	1,049 33	
		128,557 54
		$3,370,281 67

Excepting the car loan, from the C., C. & C. R. R. Co., the company has no floating debt. The original issue of Real Estate bonds was $200,000, of which the trustees retired $39,000—leaving a balance of $161,000. These were taken up by the payment of $32,200 in cash, and by Extension bonds maturing as above, which reduced the real estate bonds outstanding to the amount above stated. The Trust Fund is considered ample for the protection of these Bonds as they become due. Of the cash payment, the sum of $25,000 was provided by the Trust Fund, and $7,200 from the earnings of the road. Of this the Trustee has refunded $1,188 23, leaving a balance of $6,011 77 still due.

The directors have proposed to the holders of the income bonds, to extend them to Feb. 1, 1870, by attaching new sheets of coupons to that date—the C., C. & C. Co., having agreed to continue their guarantee, provided $200,000 of 2d mortgage bonds are deposited with them as collateral security, and a sinking fund of $20,000 per annum, payable quarterly, provided for their retirement. This was agreed to, and the deposit of mortgage bonds made. The first instalment to the sinking fund is to be paid on the 1st of June next. The Board entertain the hope that the proposition will be favorably considered by the holders, and that the arrangement will be consummated.

OFFICERS:

John Brough, *President and Superintendent.*
J. M. Townsend, *Secretary.*
Henry Wick, *Treasurer.*

Indianapolis, Pittsburg and Cleveland R. R.

The gross earnings of this road for the fiscal year ending December 31, 1858, were;

	Passengers.	Freight.	Mails.	Total.
Jan. .	$7,051.91	$9,055.40	$1,411.82	$17,519.13
Feb. .	5,883.62	9,619.07	1,411.82	16,909.51
March.	9,369.38	12,230.20	1,411.82	23,011.41
April.	9,840.00	10,919.05	1,499.15	22,258.20
May .	7,639.61	7,178.12	1,411.82	16,229.55
June.	7,182.69	5,073.42	1,411.82	13,667.43
July .	6,493.10	6,216.47	1,485.49	14,195.06
August	8,645.81	10,794.90	1,524.09	20,964.60
Sept.	9,029.20	12,612.43	1,561.70	23,203.13
Oct.	11,615.70	13,022.12	1,561.70	26,209.52
Nov. .	7,964.14	10,979.34	1,561.70	20,505.18
Dec. .	9,025.12	7,520.61	1,686.50	18,232.23
Tot.	$99,740.09	115,225.93	17,939.43	232,905.45

Expenses.

Repairs of engines	$17,864 76	
" cars	9,673 39	
" track	16,839 00	
" bridges & structures	5,276 06	
Conducting transportation	24,560 06	
Fuel	20,538 26	
Depots and stations	11,777 18	
Oil and waste	4,165 36	
Salaries	6,311 47	
Miscellaneous	17,063 60	
		134,069 14
Net earnings		$98,836 31
Interest and taxes	$72,364 13	
" " cost of floating debt	5,977 22	
		81,088 09
Balance		$17,748 22

Compared with the previous year the expenses show a decrease of $34,201 54
Decrease of gross earnings 20,613 30

Increase of net earnings $13,588 24

The floating debt has been reduced to $16,524 06.

CONDENSED BALANCE SHEET.

		Dr.
Capital stock		$835,971 26
Funded debt:—		
Domestic bonds	$34,200	
First mortgage bonds	656,000	
Second " "	167,000	
Income bonds	166,000	
		1,025,200 00
Bills payable		37,120 36
Executive Committee		17,190 52
Surplus earnings to Jan. 1, 1858		93,651 75
Net earnings of 1858		98,836 31
Sundry liabilities		1,366 45
		$2,109,336 65

		Cr.
Cost of road and equipment		$1,837,624 16
Real estate		71,409 10
Bill receivable		25,264 53
C. P. & I. R. R. stock		10,000 00
Sinking fund		41,900 06
Due from other roads		14,512 13
" individuals		10,594 23
Materials on hand		19,980 82
Interest: taxes and cost of funded debt		76,610 87
Cash		1,440 75
		$2,109,336 65

The changes from last year consist in an issue of $9,500 of 2d mortgages in adjustment of floating debt, and $500 2d mortgage exchanged for domestic bonds of like amount. One domestic bond of $100 has been redeemed.

A large amount of ballasting has been done during the year, and charged to current expenses. The fencing of the road is nearly completed—the total expenditure for fencing to Jan. 1, 1859, was $31,636 49. Construction has been charged during the year with $5,701 79, principally for dis-

count and fencing. The track and road-bed have been much improved. About 15 tons of rails have been re-rolled, and several hundred bars of iron repaired. Over 20,000 ties were replaced, and about the same number will be required this season. Two bridges require to be rebuilt—the materials for one of them being on hand. The other will cost between three and four thousand dollars.

OFFICERS.

JOHN BROUGH, *President and Superintendent.*
EDWARD KING, *Secretary.*
THOMAS H. SHARP, *Treasurer.*

Iron Manufacture in the United States.

The American Iron Association of Philadelphia has just published a report of their operations from which we make the following extracts:

"The American Iron Association has exerted itself to effect an exhaustive survey and analysis of the iron productions of the United States. It has obtained authentic statistics of the manufacture of iron in the United States and Canada of 332 blast furnaces, 488 forges, and 225 rolling mills. There are three principal departments of iron manufacture: the first is represented by the blast furnace and blooming forges, producing crude iron from the ore; the second, represented by forges, properly so-called, turning cast iron into malleable blooms and slabs; and the third, represented by the rolling mills, converting pig and malleable iron into manufactured shapes, ready for the mechanic and the civil engineer.

The following table will show the present extent and distributions of the works in these departments and in the different States of the Union:

STATES.	Anthracite furnaces.	Charcoal and Coke.	Abandoned furnaces.	Bloomery forges.	Abandoned bloomeries.	Refinery forges.	Abandoned refineries.	Rolling mills.	Abandoned.
Maine	..	1	..	..	..	..	..	1	..
N.Hamp.	..	1	..	..	..	1	..	..	..
Vermont	..	5	..	5	..	..	..	1	..
Massach.	3	7	..	..	..	5	1	19	..
Rhode I'd	..	..	..	..	..	..	..	2	..
Conn'ticut	1	14	..	..	..	6	..	5	..
New York	14	29	6	42	1	3	2	11	5
N. Jersey	4	6	12	48	29	2	..	10	1
Pennsylv.	93	150	102	1	3	110	44	91	5
Delaware.	..	..	1	..	..	..	..	4	..
Maryland	6	24	7	..	..	..	..	13	..
Virginia	..	39	56	..	..	43	..	12	..
N. Carol.	..	3	3	36	..	..	..	1	1
S. Carol.	..	4	4	2	..	..	..	3	..
Georgia	..	7	1	4	..	..	..	2	..
Alabama.	..	3	1	14	..	..	..	..	..
Tennessee	..	41	33	50	2	9	3	3	2
Kentucky	..	30	17	..	..	4	9	8	..
Arkansas,	..	..	..	1	..	..	..	..	..
Missouri	..	7	..	..	..	3	..	5	1
Illinois	2	..	..	..	..	..	..	1	..
Indiana	..	2	3	..	..	..	..	1	..
Ohio	..	54	26	..	..	..	5	15	..
Michigan,	..	7	..	3	..	..	..	2	..
Wisconsin	..	3	..	..	..	..	..	..	..
Total	121	439	272	203	35	186	64	210	15

		Furnaces.	Forges.	R. M.
Working	1,159	560	389	210
Abandoned	386	272	99	15
In all	1,545	832	488	225

The various iron regions are set forth in the following summary:

There are certain geographical iron centres which are wholly irrespective of international boundary lines.

1. There is the iron region of Northern New York, which formerly included Vermont, and makes its iron from primitive ores by means of 40 bloomeries and a few blast furnaces, three of which are now anthracite.

2. There is the hematite and primary ore belt of the Highlands, beginning in Western Massachusetts and running through Northern Nsw Jersey into Pennsylvania, containing 44 charcoal and 22 anthracite furnaces, and 60 forges, most of them making iron from the ore. Some of these works are of the oldest in the United States, and of Revolutionary celebrity. Yet the region itself holds its own, in spite of its admirable location, in the present condition of the manufacture, owing to its ruinous proximity to the seaboard ports, glutted as they are with foreign iron.

3. Eastern Pennsylvania and North-Eastern Maryland is the greatest iron region in the Union, containing as it does 98 anthracite and 103 charcoal furnaces, and 117 forges, none of which last produce iron from the ore. It is itself divisible into smaller areas, with distinct geographical and geological limits, affording primitive and brown hematite ores, and in the centre lies its anthracite region of principal productiveness.

4. North-Western Virginia and South-Western Pennsylvania constitute together a fourth much smaller iron region, with its coal measure carbonate ores, and its 42 furnaces, and two or three forges. Its production in the table is accidentally increased by the circumstance that the great Cambria works of Johnstown have been built within its northern limits.

5. Pennsylvania has still another and more important iron region in the north-west, including the north-eastern corner of Ohio. There 66 furnaces have been in blast, manufacturing iron from the buhrstone and other carbonaceous ores at the northern out-crop of the great bituminous coal region. All the forging of this region is done in the rolling mills and workshops of Pittsburg and other centres of trade upon the Ohio waters.

6. The Ironton region through which the Ohio river breaks above Portsmouth contains 45 furnaces on the Ohio and 17 on the Kentucky side, some of which use the coal of the mine for fuel, and all of them the ores of the coal measures for stock.

7. The old iron making region of Middle and Eastern Virginia, a prolongation of the Pennsylvania region across the Potomac, supplied with the same brown hematite and magnetic ores, contains 16 furnaces in its division east of the Blue Ridge, only one of which is in blast, and 30 furnaces west of the Blue Ridge. It has also 35 forges.

8. In the northern part of East Tennessee, and north-west corner of North Carolina, is seen a knot of 41 bloomery forges and 9 furnaces using the hematite and magnetic ores of the highland range; while to the west of them, at the base of the Cumberland Mountain, and on the out-crop of the fossiliferous 'dyestone' ore of the upper silurian rocks, are 14 forges and 5 furnaces. In the south-western corner of North Carolina are five forges of the same kind, and further to the east is a belt through the centre of North Carolina passing over the line of a few miles into South Carolina, consisting of 27 forges and 5 furnaces. There is also a small iron region in Northern Georgia, along the line of the Chattahoochie, which passes over into Alabama. This whole country possesses an incalculable, inexhaustible abundance of the richest ores, while its production of iron still remains at a minimum.

9. There is as yet but one principal iron region in the far West, that of Western Tennessee and Western Kentucky, with its peculiar ores, and 45 furnaces, and 6 or 8 forges; but

10. In Missouri a beginning has been made with the Iron Mountain as a centre, and there already exist 7 furnaces, in blast upon brown hematite and primitive ores.

St. Louis, Alton and Chicago Railroad.

The contest for the possession of this road has been amicably arranged, under negotiations conducted by Mr. John T. Stuart, of Springfield, Ill., on behalf of Gov. Matteson, and Messrs. J. C. B. Davis and John Cleaveland, counsel for first, second and third mortgage bondholders, in that city, for the purpose of settling the terms of a surrender of the road to the latter claimants. *The Chicago Tribune* gives the following as the terms of the agreement:

I. That Gov. Matteson shall deliver to a committee of nine bondholders (three representatives of each mortgage) actual possession of the road, with all its real, personal and mortgaged property, and shall guarantee the said committee against any interference or detriment under or by virtue of the "Spencer Lease." He will transfer to the committee all of his own interest in the charter of the St. Louis, Alton and Chicago Railroad, and will endeavor to have the whole charter so transferred.

II. The committee do not assume or recognize in any way any agreements existing between the Road or Gov. M., and the Joliet and Chicago Railroad Company or Messrs. Mitchell and Buckmaster.

III. The bondholders assume to pay the arrearages due to the employees to the amount of $154,000, $25,000 to be paid when the road is placed in their hands, and the remainder to be satisfactorily secured to them out of the first net earnings. Gov. Matteson is to pay all arrearages accruing since Dec. 1, 1858.

IV. The bondholders agree to apply the next earnings to the payment of $181,806 66, said to be due to Brown, Brothers & Co., Clark, Dodge & Co., the Ocean Bank, New York, John Anderson & Co., St. Louis, and the Bank of Bloomington, Illinois, on account of said Road, if, on investigation, the said liabilities are found to be *bona fide.*

V. The fifth and sixth points provide for the payment, out of the net earnings, of $68,445 66 for wood, and $11,554 74 for materials and supplies.

VII. The bondholders agree to pay Matteson the balance claimed by him for advances to the Road over and above the amounts received by him from the Road, said amount to be ascertained by referees, and not, in any event, to exceed $60,000.

These points constitute the basis of the contract shortly to be entered into between Gov. M. and the bondholders. The latter agree among themselves to apply the earnings of the Road, after discharging the above indebtedness, to the payment of the accrued interest on the three classes of bonds in the order of their precedence. The first mortgage was made Oct. 1, 1852, for the sum of $2,000,000; the second, June 1, 1853, for $1,500,000; the third, March 1, 1854, for $1,000,000. The total amount of accrued interest is about $800,000.

Detroit Extension of the Grand Trunk R. R.

A meeting of the stockholders of the Detroit extension of the Grand Trunk railroad was held in this city yesterday. Messrs. Thomas Galt, of Toronto, and Alexander Galt, and James Ross, of Montreal, resigned their places as directors; whereupon Messrs. Thomas Baring, Kirkman D. Hodgson, and George Carr Glyn, all of London, England, and all members of the British Parliament, were chosen to fill the vacancies. Mr. Baring is the senior member of the celebrated banking firm of Baring Brothers.

The narrow-gauge, of this State, instead of the broad-gauge, of the main line, was decided upon between this city and Port Huron, thus causing a break of gauge at Port Huron.

The road is to be ready for the cars by September 1, at which time it is hoped the Trunk road will be completed to Port Sarnia, and Victoria Bridge be opened at Montreal.—*Detroit Tribune.*

TREATISE
ON THE
PRINCIPLES OF CIVIL ENGINEERING
AS APPLIED TO THE
CONSTRUCTION OF WOODEN BRIDGES.

By S. S. Post, *Civil Engineer*,
And late Chief Engineer of the N. Y. & Erie R. R.

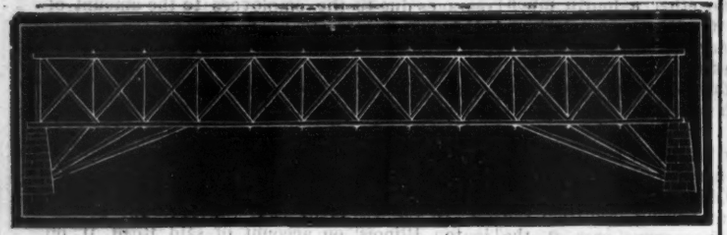
(Continued from p. 292.)

§ 86. It has been observed that in all cases where the upper and lower chords are parallel the action of the load is similar. The comparative strength, however, of trusses having this outline, may be made in a great degree, to depend upon the skilful distribution of the materials.

mmm. In the cases illustrated by *Fig.* 43, 45 and 50, it was found that the verticals and the diagonals do not sustain equal pressures, but that the forces increase in proportion as the distances from the centre of the truss increase: the end braces supporting vertically one-half the weight.

ooo. The vertical strains accumulating from the centre toward the abutments, produce the irregular deflections, which have been illustrated in *Fig.* 50 and which have led to the use of *spur-braces*, acting against the under side of the chords and supported in the masonry of the abutment or piers, as represented in the next figure.

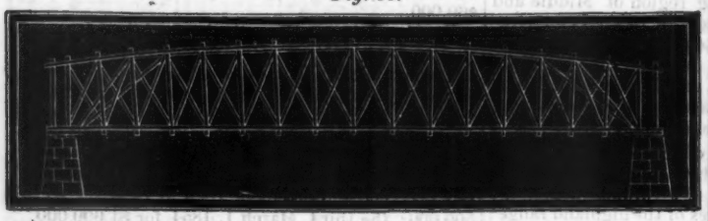
Fig. 58.



ppp. These spur-braces, in many instances, are subject to being carried away by ice, or flood wood, and interfere with the water way in such a manner as to render their use impracticable.

§ 87. The fact that the arch, or the spur-brace, had become an indispensable auxiliary to the simple truss of considerable span; and the difficulties which have been experienced in combining the arch and the truss, by any of the usual methods, so as to obtain unity of action, have led to the recent and very important improvements found in the "*McCallum Truss.*"

Fig. 59.

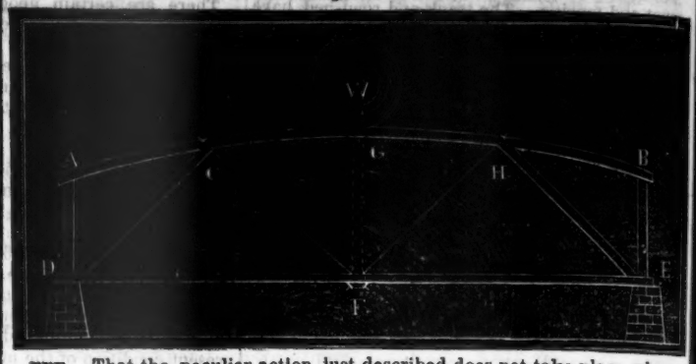


qqq. In this arrangement the arch is substituted for the "top chord" of the other systems, and forms a component part of the truss, acting in perfect harmony with the other parts.

The principles of this truss, may be partly illustrated, by *Fig.* 60, in which AB is the arch substituted for the top chord. CD and EH are arch-braces substitutes for spur-braces, and,—*passing through the bottom chord*,—act directly upon the top of the masonry of the abutments and piers.

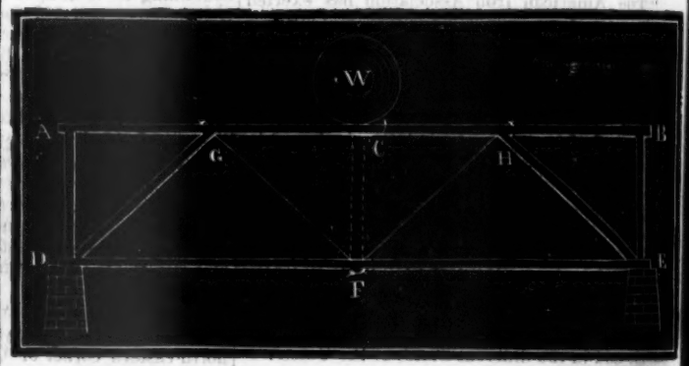
It is evident that any deflection of the arch, between C and H, will tend to separate those points, and to produce an outward thrust upon the upper ends of the braces. This tendency, again, is to generate an upward circular motion of the upper end of each brace, about its lower end resting upon the masonry as a fulcrum. Consequently, this upward tendency of motion, at the points C and H, is to raise the middle of the lower chord by tension of the iron rods CF and HF. Now, if a strut be inserted between the arch and the lower chord, as shown by the dotted lines (GF), it is clear that the arch will not be deflected by the weight (W) at the centre, and that the equilibrium of the truss will not be disturbed by its application.

Fig. 60.



rrr. That the peculiar action just described does not take place, when the top and bottom chords are made parallel to each other, will be quite obvious on an inspection of *Fig.* 61,

Fig. 61.

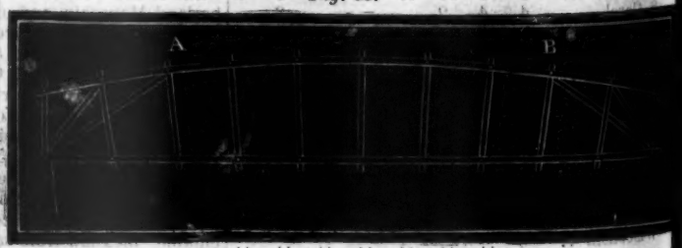


Here it will be seen that any deflection of the upper chord, between G and H, will *shorten* the distance between these two points, and the motion of the upper ends of the arch-braces will be inward and downward, increasing the deflection throughout the whole length of the chord. In this case, the point F will go down with G and H, and the introduction of the strut (CF) will only tend to the same result.

sss. To further illustrate the superiority of the *arched top* form of truss, over that of the parallel outlines, *Fig.* 62 and 63 are here introduced.

Fig. 62.

Fig. 63.



In these figures the upper and lower chords are supposed to be connected by ties, which may be either iron rods or wooden posts. The arch-braces are arranged to the same angles of inclination and at the same distance between the points of support on the abutments, in both cases. The other braces are left out of the figures, in order to simplify the elucidation of the principles under consideration.

It will readily be noticed that the truss as represented by *Fig.* 62, will sustain a load placed between the points A and B, equal, only, to that due

to the capacity of two independent beams of the same dimensions as the chords, and the same distances between the points of support.

A very different result will be obtained from the other form of truss (*Fig.* 63) as has been verified by experiment. The portion of the upper chord, between A and B, being an arch,—or arc of a circle rather than a chord,—any load placed thereon and tending to deflect it, will produce a thrust at A and B, which will be transferred directly to the abutments through the arch-braces. In this state, without other braces, the truss will sustain not only its own weight, but is capable of supporting in addition, a very considerable load.

A locomotive and tender, weighing no less than 90,000 lbs., have been run repeatedly and without risk of damage, across a bridge of 140 feet clear span, while the trusses were in the condition represented by *Fig.* 63.

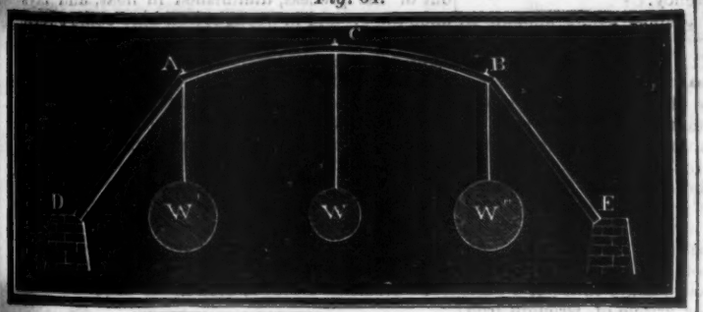
§ 88. In computation of strength it has been usual to consider all wooden bridge trusses as *open beams;* or, as "made up" with a middle web indefinitely thin (D *Fig.* 17). This theory may be applicable when the resulting forces of all the braces are upon both chords.

One of the peculiarities of the "McCallum truss" is, that the arch-braces do not, in any manner, act upon the lower chord, but simply against the masonry of the abutments.

So far then, as regards the "arch-braces" and the "straining-beam" (§ 67), this part of the system is a *confined arch*, and may serve as such while the other part of the system acts as a beam. Or, the arch part of the system may be held in reserve, to be used only when the beam part shall fail.

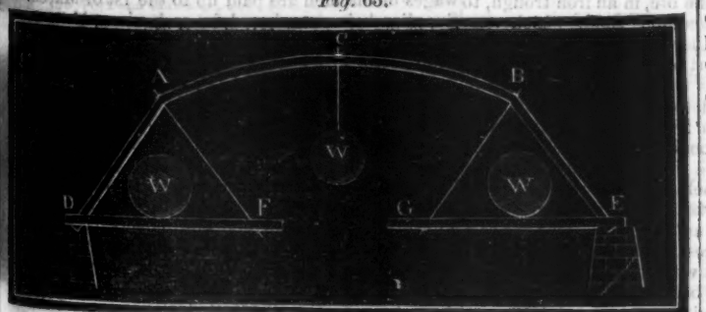
This being the case, the stability of the truss should not be materially affected by a separation of the lower chord near the middle where it is generally exposed to the greatest strain.

Fig. 64.



ttt. The arched straining beam (ACB), *Fig.* 64. and the arch braces (AD and BE) form an arch for the support of weights (W'WW''); and so long as the abutments (D and E) are unyielding, the system will be in equilibrium. Again (*Fig.* 65) the weights W'W'' instead of being suspended directly from the points A and B, may be made to rest upon portions of a lower chord as DF and EG.

Fig. 65.

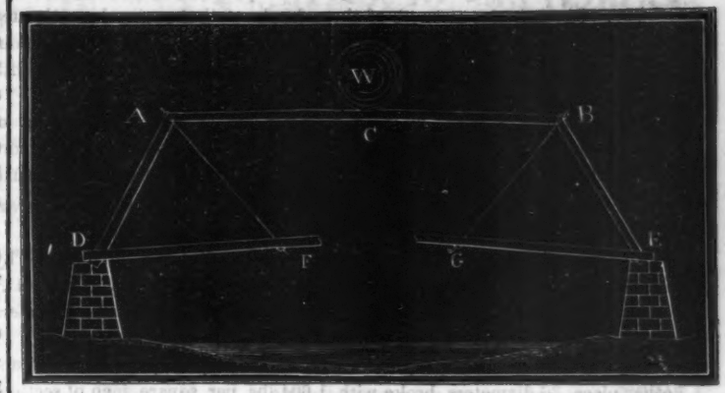


uuu. These segments of the chord are supported on the abutments (D and E) and by the tension rods, (AF and BG). But the weights W' and W'' act upon those points only through the intervention of the rods (AF and BG).

The system is still in equilibrium.

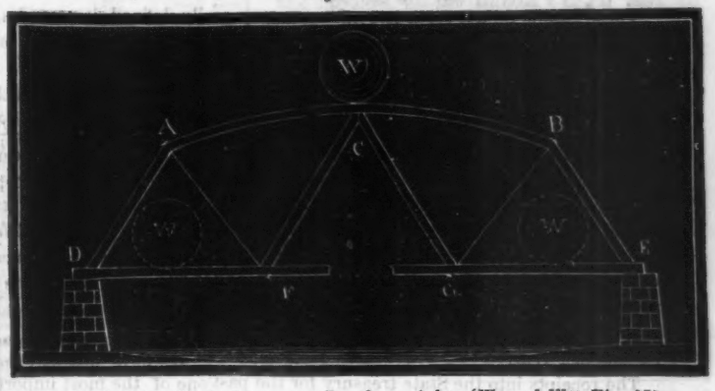
vvv. Allow the weights W' and W'' to be removed and the equilibrium will be disturbed; the deflection at C, under the influence of the weight W, will take place and the segments of the chord will be drawn upward, as in *Fig.* 66.

Fig. 66.



www. To prevent this result, and to restore the equilibrium as it existed before, nothing is required but to insert the struts.

Fig. 67.



(CF and CG, *Fig.* 67), before removing the weights (W' and W'' *Fig.* 65).

The action when the straining-beam is straight, will be reversed, and neither struts nor ties, at CF and CG will be of any avail.

The value of the arrangement, whereby a part of the system is held in reserve, was practically illustrated on the Ohio and Mississippi railroad in March, 1858. The bridges on that railroad from the Great Miami to the Wabash river, are constructed on this principle (*Fig.* 59).

Some ten miles westward of Lawrenceburg, Ia., one of these bridges 154 feet long, with a clear span of 144 feet, occurs on a curve of 4 degrees per 100 feet. An express train was thrown from the rails by coming in contact with a large piece of rock which had fallen upon the track, at about one hundred yards from this bridge.

The locomotive, tender and a portion of the cars ran so far into the bridge as to fracture six posts, twelve braces, thirty floor beams, and both chords. The latter being completely divided. In this condition the bridge held up engine, tender and cars, to the astonishment of every beholder. The strength of the track stringers and of the lateral braces and tie-rods, contributed partially to this result.

In clearing up the wreck of machinery etc. strong timbers were laid across from arched top to arched top of the opposite trusses, by means of which the engine etc. were elevated and suspended until the repairs to the bridge and track were made sufficiently to remove them.

§ 89. For bridges, the most valuable timber found in this country is the *White or Weymouth Pine.* The trunk of this tree is, in some instances, five to seven feet in diameter, perfectly straight and 100 feet in height without a limb. The wood is soft, fine grained, easily wrought and very durable.

Red or Norway Pine abounds in the Northern States and Canada, attaining the height of 70 to 80 feet, with a trunk two feet in diameter, very straight and uniform in size for two-thirds its length. It affords a compact, fine-grained resinous timber, highly esteemed for strength and durability.

Yellow or Southern Pine is abundant from New Jersey to Florida.

It attains to the height of 100 to 150 feet, and 3 to 4 feet in diameter. It furnishes a close, fine grained, moderately resinous, stiff and durable timber.

White Oak may be preferred for the parts of a structure subjected to a crushing force. It is widely diffused throughout the forests of the United

States and Canada—attaining a height of seventy to eighty feet with a diameter of five to six feet.

§ 90. The cohesive strength of these kinds of timber may be estimated at about 10,000 lbs. per square inch of section. (See table I.) The judicious engineer will not subject them to a permanent strain of more than one-fifth of this weight, or 2,000 lbs. per square inch of section.

WHIPPLE and HAUPT, in their masterly essays upon the subject of bridges agree in adopting the rule of not relying upon pine to sustain more than 1,000 lbs. per square inch when acted upon either by tension or thrust.

§ 91. The ability of timber to resist compression, depends in a great measure, on the proportions of length and sectional area (§ 15).

A cubic inch of White Oak was crushed, in the direction of its fibre, by 3,860 lbs. A similar cube of pine was crushed by 5,400 lbs. (§ 16, table II.)

A piece of Oak 2¼ feet high, and 2¼ inches square—that is, 12 diameters high—broke under a weight of 3,461 lbs. per square inch of section. A piece, 24 diameters in length, broke with 2,623 lbs. per square inch, and another piece, 36 diameters, broke with 1,604 lbs. per square inch of section, (table II.).

Sensible deflection was produced, in each of these three cases, under about half the breaking weight.

These results do not seem to conform to any easily defined law, and the data are so few and uncertain, that no attempt is here made to give a precise rule for determining questions of this kind.

WHIPPLE adopts the following table of weights, for pine, per square inch, when the force acts by thrust; the length being in terms of the diameter, or least thickness of the piece of timber.

TABLE VI.

Length in Diameters.	Weight in Pounds.	Length in Diameters.	Weight in Pounds.	Length in Diameters.	Weight in Pounds.
6	1,000	20	600	34	283
8	950	22	520	36	263
10	900	24	460	40	229
12	850	26	410	45	176
14	800	28	370	50	143
16	750	30	336	55	118
18	700	32	307	60	100

§ 92. Timber may be crushed by forces acting transversely to its fibres, at a point of bearing (§ 73).

The pressure which pine will sustain at a bearing point if applied to the whole breadth of a piece, is estimated at 200 lbs., or if oak, 300 lbs. per square inch of surface.

If the force act upon not less than half the breadth of the piece it will be sustained, as if applied to the whole breadth, without injury to the piece.

§ 93. In framing, or joining together timber for a bridge, so that one piece may act upon another, it frequently becomes necessary to reduce the section at certain parts of those pieces of timber which are acted upon laterally or by tension.

In such cases due allowance must be made for the reduced strength of those pieces of timber.

(To be continued.)

Message of the Governor of Connecticut.

The message of the Governor of Connecticut gives a favorable view of the affairs of that State. The agricultural interests are highly prosperous, and great improvements have been made in the cultivation of the soil, improvement of stock, and reclamation of waste lands. The manufacturing interest has higher hopes of remuneration than existed last year.

The receipts into the State treasury for the past year were $339,911, and the balance in the treasury on the first of April, was $12,506. The debt is only $48,620, having been reduced the past year by the sum of $32,540.

The School Fund amounts to $2,043,372, and the income from it has been $142,303, or nearly 7 per cent. The number of children in the State in January last was 103,103, an increase of 1,617 for the year. There is a marked improvement in the schools of the State.

The State prison labor is leased at a price 20 per cent. lower than formerly, but has defrayed all the expenses of the institution, and yielded a revenue of $1,871 69.

The only line of new road put in operation during the year has been an extension of the New Haven, New London and Stonington road, between Groton and Stonington. There are now six hundred and two miles of railroad constructed within the limits of this State. The amount of capital paid in is $18,727,367 31. The amount of floating and funded debt, chargeable to construction, is $11,256,092 50. The net income for the year has been $1,046,404 92, or three and one-half per cent. on the aggregate cost; while the gross receipts have fallen off over half a million of dollars. The New London, Willimantic and Palmer roads and the Providence, Hartford and Fishkill roads having failed to meet their obligations, have passed into the hands of trustees, and are now operated by them for the benefit of the bondholders.

There are now in the State seventy-three banks, with an aggregate capital of $21,540,556, and a circulation of $7,584,720. The circulation has increased $3,335,582 during the year, but is a fraction less than the average for the preceding ten years. With the exceptions referred to, these institutions have maintained their reputation by rendering all needful facilities to business, and by furnishing a sound currency.

The deposits in the savings banks amount to $13,968,462.

Great Invention in Iron Making.

We have just had the pleasure of seeing tested one of the most important improvements ever introduced in the manufacture of iron. It is a new furnace, patented by Mr. James Criswell, and we saw it in full blast at the Allen Iron Works, situated at the corner of Carondelet and Allen avenues. This patent, we were informed, could take the common ore, and with one operation not lasting half so long, and not half the expense of the old fashioned blast furnace, could turn out a pure, substantial, and superior article of wrought iron, which would sell in market at about one-half the cost of Iron by other methods, would stand a twenty-five per cent. harder test than others, and bring a premium per pound for railroad axles and any such general purposes where superior qualities are indispensable.

The first thing that attracted our attention was a collection of hammers, or crushers, worked by machinery, pounding the ore, in an iron trough, to the consistency of common sand, which was wheeled away to another part of the yard, and mixed in regular proportions with carbon, (ground stone coal,) which was taken up to a height of some twenty feet, by elevators, and there shoveled aside to be used when needed. Ascending with Mr. Criswell to this room, we saw level with the floor, some forty square brick tubes descending to the furnace and fires below, which were filled at the moment of our visit, with the mixture, as aforesaid, of iron ore and carbon. This we saw was a deoxidizing process, and by disturbing the compounded elements, we found that the flames of the boiling furnace below communicated with, and by burning the mixtures to a red heat produced deoxidization. In the centre of each of these brick tubes was placed an iron rod, communicating with an iron slide opening into a large iron bin immediately over the balling furnace, which, when deoxidizing had continued for thirty odd hours, would allow the ore to escape into the bin, and thence into the balling furnace. Here, being brought to a white heat, for a period of some fifty minutes, the ore is worked into balls of about one hundred weight, and being seized by a large pair of tongs sliding easily on a beam, placed for the purpose, each lump or ball is placed into and passed through a large circular crusher, relieved thus of all dross, and passed again through a series of revolving rollers, until the ore comes out of the process, diminished in heat, and lays upon the ground in wrought iron bars some twelve feet long, five inches wide, and one inch thick. Thus, in a few words, is the operation of making pure wrought iron from the common ore. In some instances, however, to show by experiment how easily the newly made iron may be made instantly marketable, the red hot iron is cut into convenient sizes, and instantly converted into horse-shoes or nails of every size. Nails thus made from this iron bring, we are told, a superior price, and the iron in bars has been bought up as fast as made for railroad axles. We found upon the ground several gentlemen from different parts of the country.—*St. Louis Evening News.*

New York and Erie Railroad.

The following, we take it, is an official statement of the financial condition of this company as it was on the first instant:

The entire bills payable outstanding, $543,380 20; unpaid coupons on unsecured bonds, including those in hand of sinking fund, $445,095. The wages of the men are paid up to the 1st of March. Supplies being purchased for cash, are paid up to the 1st of April. Total amount of 4th mortgage bonds issued, $3,513,000; leaving applicable to floating debt, $2,487,000; if the balance were negotiated on the terms proposed by the company, it would produce in cash $1,243,500; which would leave, after paying entire floating debt and all past due coupons on the unsecured bonds, $255,000.

This does not look so hopeless as to warrant the present depreciation in the securities of this great enterprise. The road and equipments have been much improved during the last eighteen months, greatly enhancing the real value of the property of the company, and at no previous period has there been so few unadjusted claims against the company.

Baltimore and Potomac Railroad.

The first instalment of payment on the shares of stock in this railroad have been made, and on Monday last the Chief Engineer in charge of the road commenced the work of its location, beginning on the south side of the Patapsco river, a few miles from Baltimore. He is yet occupied in locating the road line.—*Richmond Examiner.*

Railroad Bonds.

NAMES OF COMPANIES. (*The following quotations are ex-interest.*)	Amount of Loan.	Description of Bonds.	Rate Int.	Interest payable.	Where payable.	Due.	Offered.	Asked.
Alabama and Tennessee River	$838,000	1st mortgage, convertible	7	1st Jan. 1st July	N.Y.	1872	----	85
Buffalo and State Line	500,000	Do. inconvertible	7	April, October	"	1866	90	96
Bellefontaine and Indiana	600,000	Do. convertible	7	Jan'y, July	"	1866	----	75
Do. do.	200,000	Real estate, convertible	7	Jan'y, July	"	1858	----	----
Do. do.	200,000	Income, guar. Cl. Col. & Cin.	7	Feb'y, August.	"	1859	----	----
Central Ohio	1,250,000	1st mort. conv. east. sec.	7	Divers	"	1861-64	60	70
Do.	800,000	2d do. inconvertible	7	March, Sept.	"	1865	40	42
Cincinnati, Hamilton, and Dayton	500,000	1st mortgage inconvertible	7	20. Jan. 20. July	"	1867	94	96
Do. do. do.	465,000	2d do. do.	7	May, Novemb.	"	1880	82	82½
Cincinnat and Marietta	2,500,000	1st mortgage, conv. till 1862	7	Jan'y, July	"	1868	----	----
Cincinnati, Wilmington, and Zanesville	1,300,000	Do. convertible	7	May, Novemb.	"	1862	----	----
Cleveland, Painesville, and Ashtabula	567,000	Do. inconvertible	7	Feb'y, August.	"	1861	97	100
Cleveland and Pittsburgh	800,000	Do. convertible	7	Feb'y, August.	"	1860	65	70
Do. do.	1,200,000	Do. on Branches	7	March, Sept.	"	1873	60	67
Cleveland and Toledo	525,000	Do. inconvertible	7	Feb'y, August.	"	1863	75	80
Chicago and Mississippi	800,000	Do. conv. till 1857	7	April, October.	"	1862-72	30	50
Do. do.	1,200,000	Do. inconvertible	7	April. October.	"	1862-72	30	50
Covington and Lexington	400,000	Do. do.	6	April, October.	"	1867	60	65
Do. do.	1,000,000	2d mortgage, convertible	7	March, Sept.	"	1883	47	55
Delaware, Lackawanna, and Western	1,500,000	1st mortgage, do.	7	April, October.	"	1875	87	89
Florida Freeland	1,500 000	Do. not convertible.	7	March, Sept.	"	1891	77	78
Fort Wayne and Chicago	1,250,000	Do. conv. till 1863	7	Jan'y, July	"	1873	65	72½
Galena and Chicago	2,000,000	Do. inconvertible	7	Feb'y, August.	"	1863	93	94
Do. do.	2,000,000	2d mortgage, do.	7	May, Novemb.	"	1875	90½	92
Great Western (Illinois)	1,000,000	1st mortgage, do.	10	April, October.	"	1868	----	----
Green Bay, Milwaukee, and Chicago	400,000	Do. convertible	8	10. April, 10. Oc.	"	1863	84	88
Jeffersonville	300,000	Do. 2d sec. inconv.	7	April, October.	"	1873	----	----
Indiana Central	600,000	Do. convertible	7	May, Novemb.	"	1866	----	85
Indianapolis and Bellefontaine	450,000	Do. do.	7	Jan'y, July	"	1860-61	70	80
Indianap. & Cin'ti (for Lawb. & U. M.)	500,000	Do. conv. till 1857	7	March, Sept.	"	1866	87	90
La Crosse and Milwaukee	950,000	1st mort. 1st sec. conv. till 1864	8	May, Novemb.	"	1874	75	85
Lake Erie, Wabash, and St. Louis	3,400,000	1st mortgage, conv. till 1859	7	Feb'y, August.	"	1865	71	73
Little Miami	1,500,000	Do. inconvert.	6	2. May, 2. Nov.	"	1883	83	85
Michigan Central	1,000,000	No mortgage, convertible	8	April, October.	Bost.	1860	95	97
Do.	600,000	Do. do.	8	March, Sept.	"	1869	92	93
Milwaukee and Mississippi	600,000	1st mort. 1st sec. conv. till 1857	8	Jan'y, July	N.Y.	1862	----	80
Do. do.	650,000	Do. 2d do. 1858	8	April, October.	"	1863	----	77½
Do. do.	1,250,000	Do. 3d do. 1860	8	June, Decemb.	"	1877	67	72½
New Albany and Salem	500,000	Do. 1st section	10	April, October.	"	1858-62	----	----
Do. do.	2,325,000	Do. oth. sec. con. till 1858	8	May, Novemb.	"	1864-75	----	90
Northern Cross	1,200,000	1st mortgage, convertible	8	Jan'y, July	"	1873	----	75
Ohio and Indiana	1,000,000	Do. do.	7	Feb'y, August.	"	1867	70	75
Ohio and Pennsylvania	1,750,000	Do. do.	7	Jan'y, July	"	1865-66	70	77½
Do. do	2,000,000	Income, convertible	7	April, October.	"	1872	57	62
Pennsylvania (Central)	5,000,000	1st mortgage, conv. till 1860	6	Jan'y, July	Phila.	1880	100¾	101⅛
Racine and Mississippi	680,000	Do. conv., sink'g f'd	8	Feb'y, August.	N.Y.	1875	----	75
Scioto and Hocking Valley	300,000	Do. 1st sec. conv	7	May, Novemb.	"	1861	----	----
Steubenville and Indiana	1,500,000	Do. convertible	7	Jan'y, July	"	1865	----	----
Terre Haute and Indianapolis	600,000	Do. do.	7	March, Sept.	"	1866	----	----
Terre Haute and Alton	1,000,000	Do. do.	7	Feb'y, August.	"	1862-72	68	72

NAMES OF COMPANIES. (*The following quotations include the accrued interest.*)	Amount of Loan.	Description of Bonds.	Rate Int.	Interest payable.	Where payable.	Due.	Offered.	Asked
Baltimore and Ohio	1,128,500	Mortgage	6	Jan'y, July	Balt.	1875	85	86
Chicago and Rock Island	2,000,000	1st mortgage, conv. till 1858	7	10. Jan. 10. July	N.Y.	1870	94	96
Erie Railroad	3,000,000	1st mortgage	7	May, Novemb.	"	1867	95	97
Do.	4,000,000	2d mortgage, convertible	7	March, Sept.	"	1859	80¼	81
Do.	6.000,000	3d mortgage	7	March, Sept.	"	1883	69½	70
Do.	6,000,000	4th mortgage not convertible	7	April, October	"	1880	47⅛	48⅛
Do.	4,000,000	Not conv. Sink Fund, $420,000	7	Feb'y, August.	"	1875	20	23
Do.	4,351,000	Convertible Inscription	7	Feb'y, August.	"	1871	20	21
Do.	3,500,000	Convertible	7	Jan'y, July	"	1862	20	22
Hudson River	4,000,000	1st mortgage, Inscription	7	Feb'y, August.	"	1869-70	103	104
Do.	2,000,000	2d do. do.	7	16. June, 16. Dec	"	1860	95	95¾
Do.	3,000,000	3d do. convertible	7	May, Novemb.	"	1870	79¼	79¾
Illinois Central	17,000,000	Mortgage, inconvertible	7	April October	"	1870	88¼	90
Do. (Free Land)	3,000,000	M'ge 345,000 acrs-priv.7 shar's	7	March, Sept.	"	1860	95	95¼
Michigan Southern	1,000,000	1st mortgage, inconvertible	7	May, Novemb.	"	1860	84	87
New York and Harlem	1,200,000	Do. do.	7	May, Novemb.	"	1861-72	94¼	95
New York and New Haven	750,000	No mortgage, do.	7	June, Decemb.	"	1855'60'6	96	99
New Haven and Hartford	1,000,000	1st mortgage, do.	6	Jan'y, July	"	1873	94	94½
Northern Indiana	1,000,000	Do. do.	7	Feb'y, August.	"	1861	81	83
Do. Goshen Branch	1,500,000	Do. do.	7	Feb'y, August.	"	1868	71¼	72
New York Central	8,287,000	No mortgage, do.	6	May, Novemb.	"	1883	94	95
Do. do.	3,000,000	No m'ge conv. from June 57-59	7	15. June, 15. Dec	"	1864	104	104½
Panama, 1st issue	900,000	Convertible till 1856	7	Jan'y, July	"	1866	114	----
Do. 2d do	1,47[illegible],000	Do. till 1858	7	Jan'y, July	"	1866	90	91
	1[illegible],000	Mortgage, inconvertible	6	Jan'y, July	Phila.	1860	----	----
Reading	[illegible]00,000	Do. convertible	6	Jan'y, July	"	1870	85	85¼
Do.	3,469,000	Do. inconvertible	6	April, October.	"	1886	76	76¾

CITY SECURITIES.	Int'st payable.	Off'd	Ask.
New York, 5 per ct. ----1858-'60		98¾	99
Do. 5 do. ----1870-'75	May,	93	94¼
Do. 6 do. ------ 1888	August, and	103	103¾
Do. 5 do. ------ 1890-98	November.	92	93¼
Albany, 6 per ct. coup. 1871-'81 X	Feb'y, August.	99	101
Alleghany, 6 per ct. coup. ---- X	Jan'y, July	50	60
Baltimore, 6 per ct. ----1879-'90	Quarterly	97¼	100
Boston, 5 per ct. coup. ------ X	April October.	101	102
Brooklyn, 6 per ct. coup. Long X	Jan'y, July	102¾	103
Cleveland, 7 per ct. cp. W. W. 1879 X	Do. do.	100	103
Cincinnati, 6 per ct. coup. ---- X	Divers	92½	95
Chicago, 6 per ct. coup. 1873-'77 X	Jan'y, July	85	86
Do. 7 per ct. coup. ----1880 X	Jan'y, July	97¼	99¼
Detroit, 7 per ct. cp. W. W. 1873-'78 X	Feb'y, August.	100	102
Dubuque, 8 per ct. cp. ---- Long X	March, Sept.	----	100
Jersey City, 6 p.ct.cp. W W. 1877 X	Jan'y, July	99	101
Louisville, 6 per ct. cp. ---1930-'53 X	Divers	72	72½
Memphis, 6 per ct. coup. ---1883 X	Jan'y, July	64	70

CITY SECURITIES.	Int'st payable.	Off'd	Asked
Milwaukee, 7 per ct. coup. ---- X	Divers	45	70
New Orleans, 6 per ct. cp. R.R. X	Do.	75	80
N. Orleans, 6 per ct. cp. municip. X	Jan'y, July	87¾	91
Philadelphia, 6 per ct. ---1876-'98	Jan'y, July	100	100½
Pittsburgh, 6 per ct. coup. ---- X	Divers	46	50
Quincy, 8 per ct. coup. ----1868 X	Jan'y, July	67	75
Racine, 7 per ct. coup. ----1873 X	10. Feb'y, Aug	----	80
Rochester, 6 per cent. coup. ---- X	Divers	90	97¼
St. Louis, 6 per ct. coup. ---Long X	Do.	84	85
Do. do. Municipal ---- X	Do.	86	87
Sacramento, 10 p.ct. cp. 1862-'74 X	Do.	35	40
S. Fr'cisco, 7 p.c.cp. 1865, pay. N.Y. X	May, Novemb.	60	70
Do. 10 p. ct. cp. ----1871 X	Do. do.	90	91
Do 10 do. pay. N. Y. --- X	Jan'y, July	----	----
Do. 6 per ct. pay. N.Y. 1875 X	Do. do.	56	61
Wheeling, 6 per ct. coup. ---- X	Divers	----	50
Do. 6 p.ct cp. Mun. 1874 X	March, Sept.	80	81½
Zanesville, 7 do. ---- X	April, October	----	----

Cincinnati Stock Sales.

By KIRK & CHERVER.

For the week ending May 9, 1859.

BONDS.	Per cent.
Little Miami, 1st Mort. ---- 6s	84 and int.
Covington and Lexington, 1st Mortgage ---- 6s	----
Do. do. 2d do. ---- 7s	50
Do. do. Income ---- 10s	----
Ohio & Miss., E. D., Construction ---- 7s	----
Cinc., Ham. and Dayton, 1st Mortgage ---- 7s	----
Do. do. 2d do. ---- 7s	83
Indianap. & Cincinnati, do. do. ---- 7s	82

STOCKS.	
Cincinnati, Hamilton & Dayton	59
Columbus and Xenia	87¼
Indianapolis & Cincinnati	65
Little Miami	90
Ohio and Mississippi (E. D.)	----

Railroad Earnings.

The following are the earnings of the Cincinnati, Hamilton and Dayton railroad for the month of April against the corresponding month of last year:

April, 1859	$40,218 19
April, 1858	36,217 19
Increase in 1859	$4,063 00

The business of the Illinois Central Railroad for April, 1859, was as follows:

Land Department.

Acres Construction Lands sold	1,586.82 for	$23,009 50
Acres Interest Fund Lands sold	40.00 for	400 00
Acres Free Lands sold	713.96 for	12,743 76
Total sales during the month	2,340.78 for	$36,153 26
To which add Town Lot sales		1,429 65
Total of all		$37,582 91
Acres sold since Jan'y 1, 1859	12,647.02 for	$178,596 88
Acres sold prev'sly,	1,240,141.57 "	15,778,162 42
Total	1,252,788.59 for	$15,956,758 80
Construction Bonds canceled in April, 1859		$36,500 00
Construction Bonds canceled previously		1,012,000 00
		$1,048,500 00
Free Land Bonds canceled in April, 1859		$3,000
Free Land Bonds canceled previously		129,000
		132,000 00
Total Bonds canceled up to April, 31, 1859		$1,180,500 00
Cash receipts in April, 1859		$52,199 49
Do. since Jan'y 1, 1859		178,384 89
Total cash and bonds received to April 30, 1859		$2,858,182 42

Traffic Department.

Receipts from passengers	$61,368 89
Do. freight	74,773 30
Do. mails	6,358 23
Do. rent of road	5,333 00
Do. other sources	4,437 53
Total receipts in April, 1859	$152,271 05
Do. do. 1858	179,991 01
Do. since Jan'y, 1859	$574,043 49
Do. do. 1858	590,370 18

Original Land Grant, 2,595,000 acres; Railroad, 706 miles of main track, and 87 miles of sidings; 113 engines; 2,401 cars; funded debt, $18,819,500; share capital, $60 on 175,000 shares—$10,500,000.

	1856.	1857.	1858.
Traffic	$2,434,878.59	2,293,964.59	1,976,578.52
Work. exp.	1,444,546.19	1,791,231.14	1,419,954.80
Total	$990,332.40	502,733.43	556,623.72

The receipts of the Grand Trunk Railway of Canada for the week ending April 23, were $44,858 86
Week ending April 24, 1858 ..... 50,653 83

Decrease $5,794 97
Total traffic from July 1st. $1,860,939 54
Same period last year 1,947,972 87

Decrease $87,033 33

Traffic of the Great Western Railroad, for the week ending April 29, 1859.

Passengers $21,718 20
Freight and live stock 12,730 49
Mails and sundries 1,875 86

Total $36,884 56
Corresponding week of last year $44,062 80

American Railroad Journal.

Saturday, May 14, 1859.

New York and New Haven Railroad.

There has been some discussion of late in reference to the small *net* revenue derived from the New York and New Haven Railroad, and a pamphlet of not much account has been published in reference thereto. It may not be unseasonable, therefore, to take a brief review of the operations of this company from the opening of their road to the present time, embracing a period of *nine* years.

The aggregate cost of the road, adding that of the several years together, has been $42,533,022; the total earnings, $6,935,195; amount paid on account of interest, $956,345; on account of dividends, $82,856. The two last sums make an aggregate of $1,784,906, as the amount received thus far from the investments, which is at the rate of 4 2-10 per cent. The amount received by the stockholders has equalled only 3⅕ per cent. The gross earnings in the meantime have equalled 18⅕ per cent. on the cost of the road; the operating and other charges 14 3-10 per cent.,—or a trifle over 75 per cent. of the gross earnings.

Of the extraordinary charges, $386,315 have been on account of the Norwalk accident, and $223,939 on account of loss on the lease of the Canal road.

The New York and New Haven Railroad has one of the best routes in the country, with earnings per mile equalling nearly $15,000. Yet it has returned to its owners less than many roads earning one-half the per centage on the capital invested in them. It has been unlucky, and unquestionably, badly managed, for a portion, if not for the greater part of the time since it has been in operation.

A general review of our roads would show that the amount saved to stockholders bears hardly any ratio to the amount of their gross earnings. Good management seems rather a matter of luck, than a thing to be counted on with any degree of certainty. If a road happens to make a good start, so as to reflect credit upon the parties conducting it, this very fact becomes a motive to good conduct, which ripens into a habit or policy, producing the happiest results. The parties in charge feel compelled to emulate the success of their predecessors, and have a very powerful motive superadded to those of a more common kind. On the other hand, when a road becomes embarrassed, or has failed to justify expectation, its managers have no standard set them, nor any adequate motive to put forth all their powers, and both they and their road sink to a mediocrity, from which they hardly ever emerge. Several years have elapsed since the New York and New Haven Railroad have paid anything to its stockholders, save one small dividend of 3 per cent. Both they and the company have become habituated to their non-payment, and they may now be omitted with impunity, and almost without complaint. In fact the directors would gain hardly any more credit by paying than by omitting them.

It is a common delusion to expect large *net* from large *gross* earnings. It would be as proper to expect success in trade from the extent of the business carried on. It is not the extent of transactions that may have taken place, but the skill with which they have been conducted, that success depends. So with railroads. Some of our roads having the largest receipts show the smallest per centage of *net* earnings. Some parties have the faculty of making a great deal out of a road, and others none at all.

Railroad Competition--New York and Erie Railroad.

OFFICE OF THE N. Y. & ERIE R. R. Co.,
New York, 7th May, 1859.

To the Editor of the AM. RAILROAD JOURNAL:

DEAR SIR—I beg leave most emphatically to deny the assertions made in your editorial of this date, headed "Railroad Competition." All the reductions on freight have been made by the New York Central agents, without the slightest provocation or retaliation on the part of this Company, and without any excuse, except that the interests of the New York merchants required uniform rates from Boston, New York, Philadelphia, and Baltimore, to all western points. This I am ready to prove conclusively to any disinterested party, or to a committee of stockholders of the New York Central R. R. Co.

Competition between the New York Central Co. and the Buffalo and Corning R. R. Co., at Buffalo, in regard to cattle, led to reductions on both cattle rates and passenger fares; but these were made without my knowledge or assent. On the contrary, I would have prevented these reductions, had not the New York Central reduced immediately to same rates as the Buffalo and Corning Road—thus preventing any intervention on my part.

After the summer rates were established by the New York Central at Buffalo, the local rates from New York to Buffalo, were:—

	1st Class. $75	2d class. $55	3d class. $45	4th class. $30
Then were subsequently reduced by the N. Y. Cent'l to	60	50	35	20
And further reduced on 18th April to.	40	35	30	20
And on 27th April altered to.	50	35	25	20

In all these modifications we followed the New York Central, but in no instance, where there were regular rates, did we reduce below the rates of that Company. In the present contest, I have constantly held that we had no money with which to retaliate on our competitors, however unjust and uncalled for might be their aggressions.

No agreement or alliance between the New York Central and New York and Erie Companies would permit an increase of rates whilst the contest is continued with the Pennsylvania Railroad. The latter Company competes with the Northern roads at Cleveland, and every other point west of Cleveland.

May I ask, by what system of logic you arrive at the conclusion that the state of things which now exists, in regard to railroads, is the consequence of the doctrines preached by me, but never really practised on any other road? I have ever, on all occasions, urged the impolicy of resorting to the means which have brought about the present state of things, and have never resorted to them, even in self-defense, except in the case of reduction last year in the passenger fares.

I trust you will do me the justice to correct your statements, which I believe you would never have published, had you been aware how grossly you have been deceived by your informant.

Believe me, respectfully yours,
CHAS. MORAN, *President.*

Illinois Central Railroad.

The machinery on this road seems to have been maintained and run during the past year, with a good degree of economy, as will be seen by reference to the following abstract, furnished us by S. J. Hayes, Esq., Superintendent of Machinery on the Road:

Total number of engines.	110
Number of miles run by passenger trains.	936,599
" " by freight trains	846,502
" " by construction and wood trains	215,043
" " by all the trains ..	1,998,144
bbls. waste used	25,426
" tallow "	2,501
Gallons oil "	17,274
Cords of wood used	35,699
Tons coal and coke used.	8,759
Wages paid firemen and engineers	$79,447
Cost of repairs	102,592
Value of oil, tallow and waste used	18,288
Value of wood and coal used.	180,233
Cleaning engines	15,434
Total cost of maintaining and running machinery	$395,996
Average cost of wood and coal per mile run.	9.02
" " oil, waste and tallow "	.91
Wages of firemen and engineers per mile....	3.97
Cost of repairs per mile	5.18
" cleaning engine per mile.	.77
Total cost per mile of running and maintaining machinery.	19.81

The Company have now in operation 18 coal-burning engines. The cost of wood on tender is estimated at $4 31 per cord; of coal, $3 per ton.

For a similar service on the Galena and Chicago Railroad, the past year, the cost was 41.65 cents per mile; on the Chicago, Burlington and Quincy, 28.04; on the Michigan Central, 27.10.

New York City Railroads.

The following statement shows the number of passengers carried over the various lines of railroads in New York, during the year 1858:

Roads.	No. of Passengers.	Receipts.
Second avenue	4,867,371	$243,368
Third avenue	8,105,515	405,275
Fourth avenue.	2,014,486	100,724
Sixth avenue.	5,240,978	262,048
Eighth avenue	6,829,459	341,475
Total	27,057,802	$1,352,891

If we add the travel on the Brooklyn roads to this statement—which is 7,571,628—we will have the number of passengers who used the railroads

of both cities during the past year, amounting to 34,633.525, and the gross receipts therefrom $1,-731,676 25. This gives a daily average of 94,882 persons, showing the money taken every day in the year to average $4,744 10.

Debt of Louisville.

The city of Louisville owes a bonded debt of $3,001,000, and presents as assets therefor the following:

Stock in Jeffersonville R. R. Co.	$200,000
Stock in Gas Co.	188,081
Stock in Louisville and Nashville R.R.Co.	1,501,000
Mortgage stock in Lebanon Branch.	225,000
Stock in Louisville Water Co	550,000
Wharf, Real Estate, &c.	1,251,926

Morris and Essex Railroad.

This company have resolved to extend their road to the Hudson River, and to raise an additional capital of one million of dollars for that purpose, for which the books of subscription will be open at Newark on Monday, the 16th inst., from 1 to 4 o'clock. The subscription will be confined to the stockholders, who will be allowed to subscribe for their pro rata of such increase.

Ventilation of Railway Cars.

To the Editor of the Am. Railroad Journal.

Sir,—Now that the *furor* for rail car ventilation has nearly died out, will you allow an obscure individual from Canada to come before the railroad world through your columns?

I have been many years studying and experimenting upon the subject of ventilation generally, and have at the end of about fifteen years and the expenditure of more then as many thousand dollars, brought it to perfection.

All there is to do now, in order to ascertain this fact, is to come and view its operation.

As regards that branch which belongs to railway cars, I have seven now running upon the Grand Trunk railway, the operation of which will be better to be viewed in about a month from this time. The last two which have been finished and put upon the road within a month past, are an improvement upon the others.

Even if I had brought this to perfection sooner, the *public* could have derived no benefit from it for two reasons; first,—because railway companies have been kept amused by such a multitude of experiments, each of which promised to effect the object and at a trifling cost, that any advances made by one whose invention would involve an outlay of more than a few dollars, even after the inventor had made the experiment at his own expense, would not be listened to; secondly,—because these companies had really been so victimized by *tin pedlars* and back-loads of "patent ventilators"—(the knowledge of the employees not being sufficient to distinguish between them)—that they became disgusted with every thing in the shape of a "patent."

Now, however, that almost all the expedients for the ventilation of cars have one by one been dropped, and the public has about made up its mind, that if it cannot go by water in summer time, and in a clean and comfortably warmed car in winter, to stay at home; and the directors of many of these companies finding in consequence, that their receipts from passengers are not only not keeping pace with the increase of population, but actually falling off year by year, they may be induced to listen to propositions for rendering railroad traveling tolerable to humanity, even though the expense may be a few *hundred* dollars for each car.

The paucity of travelers by rail may, in part, no doubt, be laid to account of the revulsion in trade and money matters within the last two or three years, but that the great falling off of the passenger traffic is wholly due to this cause, is an erroneous supposition, and this opinion is corroborated by the statement of the Connecticut roads, published in your last Journal, where during the most prosperous years of 1854, '55 and '56 the falling-off of passengers was even greater than in 1857 and '58.

The facts are that business men have been driven by the discomfort of rail traveling (now rendered intolerable in summer, by increased speed,) to discover ways and means other than by personal attendance in their business arrangements; and pleasure travelers have found by experience that their sufferings upon railways more than counterbalanced any pleasure they have derived from their journey. In summer they are literally choked with dust and cinders, and in winter suffocated with the filth of 50 or 60 pairs of lungs, the emanations from which, (and many of them sickly ones too,) the passengers are all obliged to share and share alike! Besides—whilst their heads are in a temperature of 80°, their feet, (except the few who huddle around the stove,) are benumbed with cold. "We get all the passengers there are, and why incur unnecessary expense," railroad men think, and even say. This is not true—*you get none but those who cannot avoid it.*

Why is it that almost all the inland watering places upon the continent have, within the last few years, been deserted for *sea* bathing places? Why is it that the streams of tourists follow the great lakes and rivers? I answer, the filth of our railway cars. Make railroad traveling a pleasure, as it ought to be and as it might be, and the effect will be to double the number of travelers upon nearly all the railroads upon the continent of America.

Cobourg, May 5, 1859. H. RUTTAN.

Pacific Railroad of Missouri.

In the Journal of 9th ultimo, we gave a concise statement of the financial condition of this company which we had compiled with much care from a report made by them to the Board of Public Works of Missouri in December last. We have now before us the Annual Exhibit of the directors to the stockholders for the fiscal year ending February 28, 1859. The *earnings* of the main line during that time were:

From passengers		$331,392 02
" freight		320,351 58
" mails		21,345 83
" rents		1,019 14
" telegraph		240 38
Total main line		$674,248 95
" S. W. Branch (3 months)		2,061 17
		$676,310 12

The operating expenses for same time were:—

Main Line	$371,227 35	
S. W. Branch	3,578 94	
		374,806 29
Net earnings		$301,503 83

The *receipts* of the company for same time were $596,479 02 The discrepancy between the earnings and receipts are unusually great, owing to a large unsettled claim for freight, amounting to $66,896 28. There is also a full quarter of mail money due, amounting to $6,000.

The receipts of transportation department from opening of the road to March 1st, 1859, were $2,006,824 02

Total expenses for same time	1,270,273 54
Cash balance	$736,550 48
Interest charged to transportation department to November 30, 1858	834,455 87
Showing a deficiency of	$97,905 89

The statement of the cost and progress of the main line, west of Jefferson, does not vary materially from that previously given. It is as follows:

Work done	$1,405,360 45
Remaining to be done	3,108,639 55
Total estimated cost	$4,514,000 00
Add for machine shop at Kansas city	31,000 00
Aggregate total	$4,545,000 00

CONDENSED BALANCE SHEET, FEB. 28, 1859.

Dr.			
Capital stock:—			
Main line	$3,263,684 65		
South-West Branch.	66,973 33		
		$3,330,657	98
Bonded debt:—			
Main line	$6,803,000 00		
South-West Branch.	1,400,000 00		
		8,203,000	00
Premium received on bonds		71,594	30
Land grant rents and sales		7,777	79
Floating debt:—			
Main line	$73,460 81		
South-West Branch.	127,549 59		
Bills payable	413,072 84		
Due Robert Benson	1,381 40		
" E.D. Morgan & Co.,	60,000 00		
		675,464	64
		$12,288,494	71
Cr.			
Construction, St. Louis to Jefferson.		$5,992,198	50
" west of Jefferson		1,403,450	50
Rolling stock		614,782	23
General expenses		115,457	35
Interest and exchange		2,056,698	61
Construction S. W. Branch		1,226,010	49
Land grant, geological survey		31,925	40
Interest and exchange		318,249	27
General expenses		23,011	81
Undistributed balances		50,031	92
Int. charged to transp.	$834,455 87		
Less net earnings	736,550 48		
		97,905	89
Steamboat line, balance of accounts		718	99
Bills receivable	$162,445 18		
Bonds of town of Herman	500 00		
Sundry accounts	59,973 00		
Cash and bonds in treasurer's hands	135,136 07		
		358,054	25
		$12,288,494	71

In reference to the progress of the work the Chief Engineer says:—

The running distance has been increased by the extension of the main line 37½ miles from Jefferson to Tipton; and of the South-West Branch, 19 miles to St. Clair. The graduation of about six miles more on each branch is done, except a small amount of trimming and finishing. The heavy work east of Otterville has also been carried on to such an extent, that we could open the road to Georgetown before next winter, if the means were forthcoming. The work in Johnson county has been continued, but the collections come in so slowly that the progress does not justify the expense of an assistant to supervise it.

On the South-West Branch, the graduation is well advanced to Kinsey's, 43 miles beyond St. Clair; and I think the road can be opened to Jamestown, 67 miles from Franklin, and 104 miles from St. Louis, in November next; if the Board feel able to push the work. By the time the track is laid to Jamestown, the graduation can be completed to Bolla, and the track can be laid to that point early in the following spring. Either of these achievements will be of great importance to the South-West, as even Jamestown is nearer to Springfield than is Tipton or Syracuse, and the railroad distance saved by taking this route to St. Louis will be 63 miles.

The Legislature having adjourned without granting any aid whatever, the directors have given up all hopes of a vigorous prosecution of the main line during the present year; they hope, however, by strict economy in the expenses, and by a judicious use of all the means within the reach of the company, including the sale of free lands belonging to the main line, and of such other unencumbered property not absolutely required for the purposes of the road, and by the collection of unpaid subscriptions, to be able to meet the interest punctually in July next, and to pay all engagements.

The equipment of the road consists of 12 passenger and 14 freight engines; 21 first class, and 5 second class passenger and mail cars; 6 baggage and express cars; 269 freight and 137 construction cars.

Earnings of main line for twelve months ending February 28, 1859.

	Pass'gers.	Freights.	Mails.	Total.
M'rch	25,818.22	27,646.14	1,302.08	54,766.44
April	31,752.84	30,379.58	1,302.09	63,434.51
May	31,069.46	22,310.27	1,302.08	54,681.81
June	22,897.25	14,862.37	1,302.08	39,061.70
July	24,404.23	29,012.25	1,875.00	55,291.43
Aug.	28,770.33	34,210.67	2,037.50	65,018.50
Sept.	32,860.52	41,541.38	2,037.50	76,439.40
Oct.	36,420.63	26,580.35	2,037.50	65,038.48
Nov.	28,021.83	25,093.51	2,037.50	55,152.84
Dec.	24,515.49	24,531.28	2,037.50	51,084.27
Jan.	22,408.77	19,967.54	2,037.50	44,413.81
Feb.	22,452.45	24,116.24	2,037.50	48,606.19
Tot.	$331,392.02	320,251.58	21,345.83	672,989.43

Insurance Law.

GOODS STOLEN DURING FIRE.—LIABILITIES OF INSURERS.

In the case of Tilton *vs.* The Hamilton Fire Insurance Company, (1 Bosworth's N. Y. Superior Court Reports, 367) the question arose whether the owner of a stock of goods insured with the defendants company, could recover for a portion of them removed by direction of the defendants to save them from the fire, but afterwards stolen from their custody.

The facts of the case were somewhat in dispute as well as the law. For the purpose of deciding the question involved, the court assumed the facts to be as follows.

The goods were a stock of ready made clothing in plaintiff's store, in the city of New York. The store was burnt down, and if the goods had not been removed they would have been entirely consumed by fire. A few moments after the fire was discovered the insurance watch arrived, broke open the doors, took possession of the store, and commenced moving the goods across the street. The police formed lines across the street about midway of the block, above and below the fire, to prevent persons approaching the building. The goods were removed from an honest motive to save them from total destruction by fire, which was inevitable unless they were removed from the premises mentioned in the policy. Extreme vigilance and caution were used to prevent any of the goods from being lost by theft or otherwise during the process of removal. But notwithstanding all the vigilance used, a quantity of the goods were stolen.

The following is the substance of the opinion of the majority of the court, holding defendants liable.

Bosworth Ch. J.—Is the loss under the peculiar facts of this case, a loss by fire, within the meaning of the policy? The fire created a necessity of immediately removing the goods, in order to save the whole or part of them from being burned up. In making such a removal, even if all be removed before the fire reaches that part of the building from which they were taken, a loss in spite of all precautions, may be produced by at least two causes incident to such an act.

One is, a partial injury of some of the goods themselves, by their hurried removal, and the confused state in which they may necessarily for a time be thrown together. Another is, from a theft, or abstraction of some of the goods. If these are not material results, it is believed that common experience shows that both, in large cities, are almost invariably inevitable results. Was not the fire the immediate cause of, though not the active agent in, the destruction of the goods.

The distinction between the proximate, and remote cause of a loss becomes in some cases so faint, that it is difficult to discern it. I think it a sound rule that when the damage in any particular case is a direct and unavoidable consequence of the occurrence of a peril insured against, the insurers are liable, though the immediate agent was not such peril. All the consequences inevitably following from the peril insured against, or incident thereto, are properly attributable to the peril itself.

The fire in this case created a necessity of removing these goods, and left no other alternative possible, except their total consumption by fire.—If they had not been removed, and if the fire had been extinguished before the building was consumed and if by extinguishing it the goods had been partially damaged by water. I understand it to be conceded by all the cases, that such a loss would be covered by the policy.

In that case there would have been no damage to the goods from their having come in contact with the fire, or from actual burning. In the case supposed, the goods owing to their peculiar position, were damaged by water employed to extinguish the fire. In other words, it resulted from an effort necessarily, as well as properly made, and one which the contract of insurance contemplated would be made in case of fire, to save the insured property from total destruction.

In the present case, the removal was an act necessarily and properly done, not to extinguish the fire, but to keep the goods from coming in contact with the fire, and made, when it was apparent, and the result demonstrates, that it was impossible to extinguish the fire, until the building and its contents were destroyed. This was an act which the contract contemplates would be done on such an emergency. It not only contemplates it, but if the plaintiff's had been apprised of the fire, in time to remove their goods before the fire could reach them, and they as reasonable and prudent men, knew that they could make such removal, but instead of attempting it had supinely stood by and had seen the goods consumed, no court or jury would charge the company with the loss, unless coerced by some rule, which they were inexorably compelled to follow.

But an honest and faithful effort is made to prevent the fire from destroying the whole. In consequence of that effort, a large part of the insured property is saved. In spite of it, a part of such property is lost, but not burned. Without such effort all would have been burned. Would not the part that was lost, be lost in consequence of the fire, and unavoidably so lost?

If the insurers are not liable for such loss occurring under such circumstances, then the assured ought not to be required to make an effort to remove his goods in case of fire in order to save the insurer from greater loss; and the parties who undertake to remove the goods should be charged as wrong doers, for the consequences of their interference, unless such interference could be shown necessary to prevent the spreading of the fire, to other buildings.

Suppose the fire had reached the goods in question and some of them had been damaged directly by the fire, and the others had been removed, and none of them had been lost or stolen, but some of those removed had been damaged by the act, notwithstanding the exercise of extreme precaution and care to avoid such a consequence, would not that damage be covered by the policy? I think it would.

But even in that case, fire would not have been the immediate cause of the damage, unless all such acts as are a cause of damage and as the fire renders proper and necessary to avoid greater inevitable loss, are to be attributed to the fire itself. In any other views, the removal of the goods damaged by such removal, and not the fire, would be the proximate cause of the loss.

But I can see no distinction in principle between a partial injury to some of the goods saved by the removal, and a loss of a part of those attempted to be removed, to save the whole from unavoidable destruction, when they are lost in spite of the extreme of human precaution to prevent loss or damage from the act of removal, whether such loss be caused by theft, or some unavoidable casuality during the removal, which renders the article valueless.

Condition No. 6, annexed to, and forming a part of this policy expressly declares "that in case of fire, or of loss, or damage thereby, or of exposure to loss or damage thereby, it shall be the duty of the insured to use their best endeavors for saving and preserving the property; and if they should fail to do so, this company will not be answerable for the loss or damage sustained in consequence of such neglect."

Hence, the duty, by the terms of the policy, was imposed on the plaintiff, in such a state of things as is shown in this case to have existed, to use his best endeavors to save the goods by removing them. Suppose the plaintiff had been present, and used such endeavors, and in spite of all the care and precaution that could be used for their preservation and safety, some are lost, or

stolen, but the residue are saved from a total destruction which would otherwise have involved all of them.

He would have done precisely what the policy required him to do as a condition of retaining the liability of the company for the value of such part, as the use of his best endeavors could not save from injury. As to those which his great efforts, and vigilance have saved unharmed, he has no claim against the company, because as to them there is no loss. But on the defendants' theory, the company is not liable for the loss of those which human effort and care could not save because they were not consumed by fire. Yet it was his duty to remove all of them, because by the best endeavors that could be used all could not be removed. All having been removed, there is no liability, because those which are saved are uninjured, and those which it was impossible to save were not burned or damaged by fire. And yet the fire, by the express terms of the contract between the parties, made it the duty of the insured to remove the goods, in the condition of things existing at the time, if it was reasonably certain that such an act would save the company from a greater loss than would have fallen upon it if no removal had been made.

I cannot resist the conclusion that such a loss was one which the parties to the contract contemplated might occur, and that it was the intent of the parties, that any loss which should unavoidably result from the fire should be covered by the policy although not caused directly by actual burning.

Central Railroad of New Jersey.

The board of directors have issued their report for the 12th year ending April 1, 1859, of which the following is a synopsis:

Receipts from passengers		$175,170 55
" merchandise		298,782 73
" coal		381,934 08
" mail, express, rents, etc		15,065 98
		$870,953 34
Running expenses	$81,773 31	
Repairs of road	48,629 90	
" engines	22,098 12	
" cars	15,383 98	
" b'ldg's, bridges, etc	11,154 99	
Expense account	20,567 75	
Wood consumed	75,303 82	
Coal "	17,911 16	
Ferry expenses	40,369 88	
Miscellaneous	7,188 00	
		350,280 73
Net earnings		$520,672 61
Stock issued for dividend	$200,000 00	
Sundry accounts	31,722 36	
Materials, etc., reduced	24,509 26	
Cash from old account	2,629 40	
		258,861 02
		$779,533 63
Dividend 10 per cent	$200,000 00	
Interest on bonds, notes, etc	256,672 26	
260 income bonds purchased	215,650 00	
Reduction of indebtedness	55,409 95	
State tax ½ per cent	23,851 34	
Charged to depreciation	13,499 01	
Sundry property accounts	6,331 72	
		771,414 28
Cash on hand		$8,119 35

The surplus receipts of the year have been applied to the re-purchase of the income bonds. Of the $500,000 issued in the fall of 1857 and winter of 1858, at 75 per cent., $260,000 have been redeemed at an average cost of 83 per cent. The difference between these two prices is charged against the year's earnings as a loss. A reduction in bills and accounts payable of $55,409 95, has also been made. A few property accounts have been slightly increased, and the railroad account has been slightly reduced.

The profit and loss account has been credited with the gross earnings, $870,953 34, and debited as follows:

Ordinary expenses, as per statement	$350,280 73
State tax ½ per cent	23,851 34
Interest on bonds, etc	256,672 26
Losses in re-purchasing income bonds	20,650 00
Dividend, 10 per cent	200,000 00
Balance of profit and loss account transferred, partly to credit of income bonds towards losses on future purchases, and partly to property accounts to cover depreciation	19,499 01
	$870,953 34

By this statement it will be seen that the balance of the earnings which remained, after deducting expenses, taxes and interest, was $240,149 01, equal to 12 per cent. on the $2,000,000 of capital stock. The interest, $210,000 paid on the $3,000,000 mortgage bonds, added to the above $240,149 01, gives $450,149 01 as the return on the $5,000,000 stock and bonds, equal to 9 per cent. on the whole if it had all been stock. After deducting the losses incurred in purchasing income bonds, and reserving $200,000 to cover a dividend of 10 per cent., the balance of the account, $19,499 01, has been applied (as was the balance of the previous year's profits) to the reduction of various accounts, in pursuance of the policy of keeping down the cost of the property as much as possible.

To represent the net earnings absorbed in the reduction of bonded and other indebtedness, a dividend of 10 per cent. has been declared and paid by an addition of $200,000 to the capital stock.

It is the intention of the board to increase the capital stock by a further issue of $300,000, and thus provide for the balance of the income bonds. It is not necessary to pay these bonds before 1863, but they must be "provided for" by a suitable fund before the net earnings are released from their lien, so as to be applicable to cash dividends. It is safe to assume that a cash dividend will be made in November.

Many holders of bonds of the first series ($500,000) of the first mortgage issue, which fall due August 1st, 1860, have applied to have their bonds extended 20 years from that date. A decision will be made in the fall, whether to allow this to be done, or to further increase the stock $500,000, (being the whole amount the board have authority to issue,) and to pay them off. The board incline to the latter course, but many of the stockholders recommend the extension, as tending to keep up dividends. If it is decided to renew the bonds, the option will be given to holders either to extend them, receiving a new sheet of coupons, or to sell their bonds to parties ready to buy them at par and extend the time.

A comparison of the receipts and expenses of the past two fiscal years gives the following results:

	1859.	1858.	*Increase.*
Receipts	$870,953 34	$682,940 30	$188,013 05
Expenses	350,280 73	325,747 68	24,533 05
Net ern'gs.	$520,672 61	$357,192 62	$163,479 99

The receipts from passengers have been nearly stationary, owing to the continued stagnation of business, but are now on the increase. The receipts from merchandise have increased 10 per cent. with a prospect of a steady advance as business revives. The receipts from coal have increased 75 per cent. and are now the largest source of revenue.

The expenses show an increase of less than $25,000. With an increase in the mileage of 33 per cent. the running expenses show a *reduction* of $3,455 41, and an increase in the fuel consumed of only 20 per cent. Repairs of road show an increase of $14,500, all the ballasting done during the year having been charged to this account.

The company own 30 engines, 25 of which are wood burners and 5 are coal burners. Two more coal burners are ordered, and more may be required during the year, if the business continues to increase. Of these engines, 25 are in good order, 2 in fair order, 2 require general repairs and 1 is rebuilding. Of these engines 22 are narrow gauge and 8 are broad gauge. At the present time 22 are required for daily use. A gradual change of the wood engines into coal burners will be commenced as soon as the company become satisfied of the best plan of construction to be adopted; and the experiments making by other companies are carefully watched with this design.

The equipment of cars is as follows: 19 first class passenger cars, 2 second class passenger cars, 7 baggage and mail cars, 68 house freight cars, 18 covered cattle cars, 5 open cattle cars, 89 platform freight cars, 10 eight wheel coal cars, 6 caboose cars, 42 four wheel gravel cars and 10 dirt cars.

All the cars are in good working order and sufficient for the company's business at present, but purchases will soon have to be made.

The total number of miles run by all the trains has been 488,871. The ferry boats have made 2,818 trips, of twelve miles each, between New-York and Elizabethport, the commencement of the road; and run 3,819 miles on excursions, making a service of 37,635 miles.

The number of passengers carried has been 319,583. The number carried one mile, has been 6,985,370, which is equivalent to 93,138 through passengers. This does not include commuters or free passengers. The number carried the previous year was 277,409, who traveled 6,726,377 miles; equivalent to 89,685 through passengers; showing an increase the present year of 42,174 in the number of passengers, and 258,993 in the miles traveled, equivalent to an increase of 3,453 in through passengers.

The number of tons of merchandise carried has been 144,557. The total movement of merchandise, or number of tons carried one mile, has been 7,456,282, equivalent to 99,517 tons of through freight. The tonnage of the previous year was 115,424, which was carried 6,604,744 miles, equivalent to 88,063 tons through freight; showing an increase the present year of 29,133 tons, and 851,538 in the miles carried, equivalent to an increase of 11,354 tons in the through freight to New York.

The number of tons of coal (2,240 lbs. each) carried has been 564,504. The total movement of coal, or number of tons carried one mile, has been 28,638,276, equal to 454,576 tons carried through. The tonnage of the previous year was 310,445, which was carried 15,328,637 miles, equivalent to 243,311 tons of through coal; showing an increase the present year of 254,059 tons, and 13,309,639 in miles carried, equivalent to an increase of 211,265 tons in coal carried over the road from Easton to Elizabethport.

This coal tonnage has been divided between the Lehigh and Lackawanna regions, as follows:

	1859.	1858.	Increase.
Lackawanna region	426,575	224,090	202,485
Lehigh "	136,929	86,355	51,574
	564,504	310,445	254,059

The year just closed has been, to the company, one of continued prosperity and success. The remarkable geographical position of the road has secured a remunerative business, which gives every promise of continuing steadily to develope. The favorable returns of the present year are made in a season of dullness and depression in every branch of business, and of stagnation in the coal trade.

Ordinary Receipts, Expenses and net earnings of Railroad and Ferry.

	Receipts.	Expenses.
April, 1858	$70,907 77	$25,672 69
May	72,978 36	30,124 42
June	73,826 99	29,916 36
July	77,285 84	32,246 20
August	77,845 30	29,177 80
September	72,628 74	28,883 99
October	71,397 54	32,511 98
November	72,992 35	27,518 79
December	79,616 98	30,829 68
January, 1859	61,145 27	28,564 88
February	65,809 06	24,763 36
March	74,519 14	30,070 58
Total	$870,953 34	$350,280 78
Total, 1857-8	$682,940 30	$325,747 68
Increase	$188,013 04	$24,533 05

CONDENSED BALANCE SHEET.

Construction		$3,378,097 89
Land damages		289,890 84
Engineering		95,257 83
Interest		431,939 62
Discount on second mortgage bonds		225,000 00
Miscellaneous expenses		65,710 61
Station houses, shops and water stations		131,800 00
Land and work at Elizabethport		133,479 03
Ferry interest and boats		256,350 00
Engines		256,200 00
Cars		168,500 00
Telegraph, docks, machinery, etc.		39,636 80
Materials on hand		96,782 69
Cash and cash items		17,335 87
		$5,580,981 18
Capital stock		$2,200,000 00
First mortgage bonds, due 1860	$500,000 00	
First mortgage bonds, due 1865	500,000 00	
First mortgage bonds, due 1870	500,000 00	
		1,500,000 00
Second mortgage bonds, due 1875		1,500,000 00
Income bonds		186,000 00
Bills payable		175,000 00
Balance of sundry accounts		19,981 18
		$5,580,981 18

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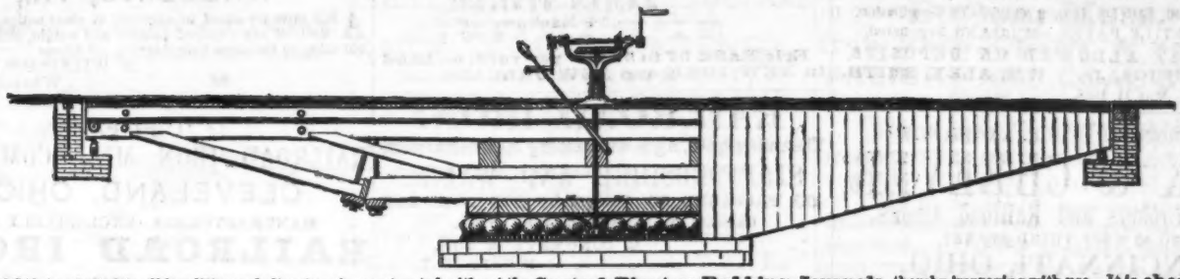

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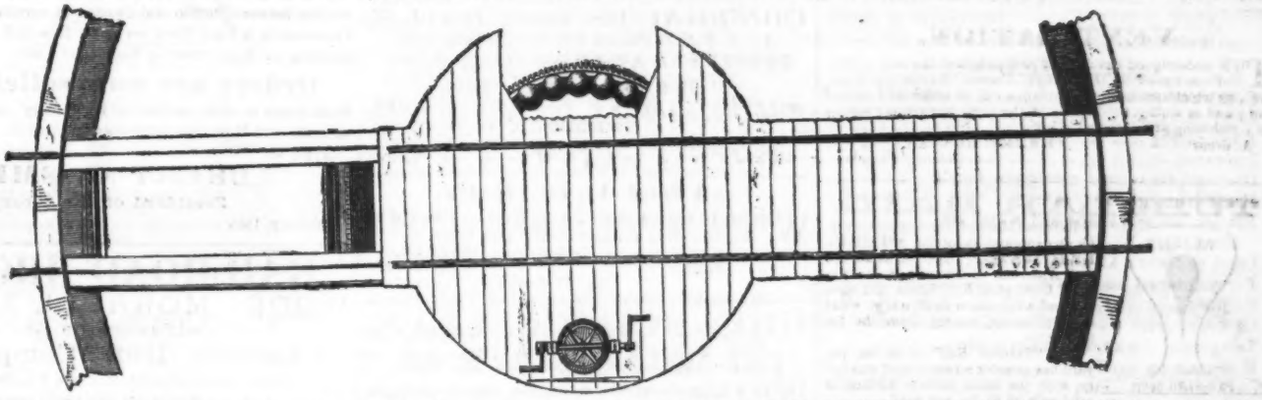

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NEW YORK, May 11, 1858.

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THE undersigned has devised and patented the only system of ventilation for *Buildings, Vessels*, RAILROAD CARS, &c., by which spontaneous ventilation can be effectually carried out; and is willing to dispose of the same to parties desirous of purchasing at a reasonable price.
Address HENRY RUTTAN,
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Railroad Managers will be interested by an examination of the "TUBULAR RAIL," patented in Europe and America by STEPHENS & JENKINS, Covington, Ky. These rails have decided advantages over any rail hitherto made, among them the following:—
The "Tubular Rail" of 50 lbs. per yard has greater strength and elasticity, with the same outside surface as solid rails of 60 lbs. per yard.
Its density is greater,
Its welding nearer perfect, and
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Unlike other new forms of rail, it can be put down on the same chairs, and with the same fastenings, used with common T rails.
The arrangements to manufacture are such that these rails can be furnished of any American or Foreign make.
Reference is made to the officers of all the railroads in the vicinity of Cincinnati.
Additional particulars and circulars may be had by addressing E. W. STEPHENS,
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THE UNDERSIGNED,
Sole Agents to Messrs. GUEST & CO.,
The Proprietors of the Dowlais Iron Works,
Near Cardiff, South Wales,
ARE duly authorized to contract for the sale of their G. L. Railroad Iron, and Common Bars, on most advantageous terms.
R. & J. MAXIN, 70 Broad st.

STEEL, FILES, &c.
R. GROVES & SONS,
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MANUFACTURERS of warranted Cast Steel, superior quality, for Tools, Machinery, and Engineering purposes. Single and Double Shear, Blister, German Spring and Sheet Steel of every description—also, Cast Steel Files of high reputation, especially adapted for the use of Machinists, and Saws and Edge Tools of all kinds.
A stock of the above goods constantly on hand.
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The Undersigned, Agents for the Manufacturers,
ARE PREPARED TO CONTRACT TO DELIVER
Free on Board at Shipping Ports in England, or
At Ports of Discharge in the United States,
RAILS OF SUPERIOR QUALITY,
And of Weight or Pattern as may be required.
VOSE, LIVINGSTON & CO.,
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THE subscriber is prepared to enter into CONTRACTS FOR RAILS delivered at an English port or at a port in the United States.
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Erie Rails, 57 to 58 lbs. per yard, on hand in NEW YORK and NEW ORLEANS.

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The undersigned, Agents for leading Manufacturers in
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CONTRACTS FOR RAILS,
AT A FIXED PRICE OR ON COMMISSION,
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Or at a Port in United States,
WILL BE MADE BY THE UNDERSIGNED,
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500 tons T rails on hand 54 to 57 lbs. per linear yard.

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WELSH or Staffordshire make, delivered on board at an English port or at a port in the United States.
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Lap-Welded Boiler Flues,
1½ to 7 inches outside diameter, cut to definite length, 2 to 20 feet as required.
Wrought Iron Welded Tubes,
From ⅛ to 5 inches bore, with Screw and Socket Connections. T's, L's, Stops, Valves, Flanges, &c., &c.
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IRON AND STEEL
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BOILER PLATE,	CAR AXLES,
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CUT NAILS and SPIKES,	PIG IRON, etc.

Having the selling agency of a number of the Rolling Mills Furnaces and Forges in this State, orders for any description of Iron can be executed.
August 16, 1854 1y33

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RAILROAD IRON.
The Crescent Manufacturing Company,
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ARE now prepared to execute, at short notice, orders for Rails of any required pattern and weight, and to re-roll old rails, on the most liberal terms Address
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MANUFACTURERS EXCLUSIVELY OF
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THIS is a new ROLLING MILL, having been working only eighteen months, and confined to work for roads on this line between Buffalo and Chicago in re-rolling old Rails. The capacity is Forty Tons per day. It is well situated for receiving old Rails, either by Railroad or Lake.
Orders are now solicited
From Roads in other sections of the country; and work will be made with New Iron in the heads, if desired.
Apply to
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President of the Incorporation.
February, 1858.

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WOOD, MORRELL & CO.,
Having leased the extensive Works of the
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Situated at JOHNSTOWN, CAMBRIA CO., PENNA.,
And purchased all their real estate,
ARE now prepared to execute, at short notice, orders for RAILS of any required pattern or weight, on the most liberal terms.
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THE RENSSELAER IRON COMPANY,
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OFFER Rails of their own manufacture deliverable as may be desired by purchasers.
OLD RAILS
received in exchange for new, or for re-manufacturing.
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These works have been greatly enlarged the past year, and are, therefore, prepared to execute orders promptly for RAILROAD IRON of any pattern and weight, Car Axles, Spikes, and Merchant Iron. They have on hand patterns for T rails, of the following weights per lineal yard, viz:—25, 30, 36, 40, 45, 50, 60, 62, and 75 lbs.
Samples of Rails and Merchant Iron may be seen at the office of the Company, 46 Exchange Place, New York.
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or THEO. STURGES, Treasurer,
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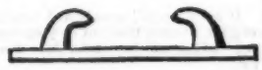
NEW YORK RAILROAD CHAIR WORKS.

J. B. GREEN & CO., Proprietors.

SUCCESSORS TO THE

New York Wrought Iron Railroad Chair Company.

Office, No. 51 Exchange Place, New York.



HAVING recently purchased, at Receiver's Sale, all the Patent Rights owned by the late *New York Wrought Iron Railroad Chair Company*, and also the entire machinery for manufacturing their improved Wrought Iron Railroad Chair, we are now fully prepared to receive and fill all orders from responsible parties, to any extent, with promptness and dispatch.

The thickness of the lips of our Chair increases through the bend, where the greatest strength is required, and diminishes towards the edge; so that a less weight of metal may be used, and a strength acquired equal, if not superior, to that of a heavier Chair of uniform thickness.

We invite the attention of parties wishing the best Wrought Iron Chair now in market, to our works for a supply; believing they combine qualities superior to any others now manufactured.

The Chairs weigh from seven and a-half to fifteen pounds, according to the thickness of the Iron and size of the Chair. To enable us to give you a perfect fit, it will be necessary always to send a section of the Rail. We cannot undertake to make Chairs without a proper pattern, as it is impossible to make a perfect fitting Chair from a drawing.

Our manufacture of Chairs are used on a large number of Roads, of which the following list comprises some of them, viz

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New Jersey Central Railroad Company,
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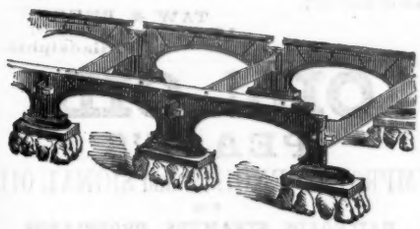
CAST-IRON ENDLESS RAIL,
FOR CITY RAILROAD;

Now being laid in Philadelphia and elsewhere;

THIS road is exclusively of cast iron, without tie, string-piece, or chair; Rail 85 to 100 lbs. per yard; Durability four fold over the present roads, with 65 lbs. groove rail: And with a saving on first cost; effecting a reduction in current yearly repairs, and relays, of at least $1,000 per mile.

Also,—



BEERS'
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FOR LOCOMOTIVE USE;

This road can be built and equipped, without additional cost over a road with 56 lbs. T rail; saving not less than 60 per cent. on motive power, 50 per cent. on dead weight, and 80 per cent. on repairs of way; thus reducing the yearly expenses from $1 500, to $2,000, per mile. For full particulars, with drawings, relating to both roads, see a recent Treatise, entitled Railroads, their construction and management, with the remedy, from twenty-five years experience, by S. A. BEERS, Civil Engineer, BROOKLYN, N. Y. Price 50 cts, Address the author.

The undersigned is prepared to construct, by contract, the above roads, in any part of the U. S. or Europe, at the shortest notice, being aided by a staff of contractors of the most extensive experience.

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Railroad Materials, Locomotive and Car Findings,
MACHINERY AND MACHINISTS' TOOLS,
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WHITE AND YELLOW CAR GREASE,
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LANTERNS OF ALL DESCRIPTIONS,
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AGENCY OF THE KEROSENE OIL COMPANY.

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Rails, Sleepers, Chairs, Spikes, Wheels, Axles and Tires.
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Locomotive, Hand and Ship Lanterns; Car Trimmings of all descriptions. Steam and Water Gauges; Signal Bells, etc., etc.
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Orders filled with **despatch** and at the **lowest** prices.

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ARE agents for, and prepared to furnish at manufacturers' prices,
RAILROAD IRON,
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RAILROAD CARS,
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NEW YORK, January, 1859.

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Iron Rails, Chairs, & Spikes,
FREIGHT AND COAL CARS,
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Wheels and Axles of all kinds,
LOWMOOR, AMES', BOWLING AND NASHUA TIRES,
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Of all kinds for Shops and Tracks.
Car Trimmings, Paints, Oil, Varnish, Car and Switch Locks, Ventilators, Lanterns, Head-Lights, Gauges, Rubber Springs, Chairs, Hose and Belting, Ash, Pine and other Timber, and ALL MATERIALS USED in Equipment and Repairs of Railroads, Engines and Cars, *at lowest prices.*

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RAILROAD AXLES, WHEELS AND CHAIRS,
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IRON FORGINGS OF VARIOUS KINDS, ETC., ETC.
STEEL AND RUBBER SPRINGS,
LOCOMOTIVE AND HAND LANTERNS,
PORTABLE FORGES AND JACK SCREWS,
COTTON DUCK FOR CAR COVERS,
BRASS AND SILVER TRIMMINGS.

Also, Sole Agents for the Manufacturers of Car Head Linings.

Orders for the purchase of goods on commission, aside from our regular business, respectfully solicited.

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MORRIS K. JESUP. JOHN KENNEDY. GILBAD A. SMITH.
M. K. JESUP & CO.,
RAILWAY AGENTS AND BANKERS,
44 EXCHANGE PLACE,
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AGENTS FOR THE SALE OF
FOREIGN AND AMERICAN RAILROAD IRON
AND ALL MATERIALS NECESSARY FOR THE
Construction, Equipment & Operating of Railways.
RAILWAY AND OTHER SECURITIES
BOUGHT AND SOLD
Either privately or at the Board of Brokers.

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DEALERS IN
RAILROAD IRON,
CHAIRS AND SPIKES,
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PASSENGER AND FREIGHT CARS.
MANUFACTURERS' AGENTS
FOR Zeller's Iron Turn Tables, Dimpfel's Patent Blower, Gardiner's Volute Car Springs and
RAILWAY SUPPLIES GENERALLY.
ALSO
NEGOTIATORS OF SECURITIES.

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THE undersigned have American and Foreign Railroad Iron for sale, deliverable in New York and other markets.

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NEW YORK, January 1, 1859.

Boston Locomotive Works,

Late Hinkley & Drury,
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BOSTON.

LOCOMOTIVE AND STATIONARY
STEAM ENGINES;
BOILERS;
Iron, Brass, Copper and Composition Castings;
COPPERSMITH'S WORK,
AND ALL KINDS OF RAILROAD MACHINERY
FURNISHED AT SHORT NOTICE.

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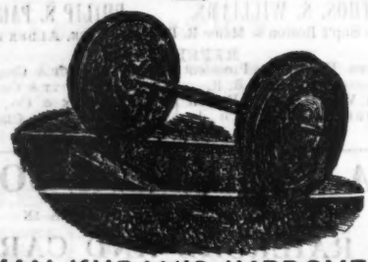

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RAILROAD WHEEL,
PATENTED MAY 1, 1849.
Manufactured under the Personal Superintendence of the PATENTEE, as above.

ORDERS for any quantity of Wheels executed with dispatch, and Wheels and Axles fitted in the very best manner, and at the lowest rates.

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LOCOMOTIVE WORKS,
SUCCESSORS TO
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MANUFACTURE COAL or WOOD BURNING LOCOMOTIVES, Steam Fire Engines, Portable ENGINES and BOILERS, Cast Steel SPRINGS for Engines, Tenders, Passenger or Freight Cars; SHAFTING and ALL KINDS of RAILWAY MACHINERY.

They also furnish to order TYRES, DRIVING WHEELS and AXLES, CASTINGS and FORGINGS.

Boiler Work furnished with dispatch.

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POOLE & HUNT,
Iron Founders and General Machinists,

ARE prepared to fill at short notice and of best materials and workmanship, orders for

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PLATE CAR WHEELS and CHILLED TIRES, equal to any produced in the country.
WHEELS AND AXLES fitted for use.
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MACHINERY of the most approved construction for Flouring and Saw Mills.
GASHOLDERS of any size, and Machinery and Castings of all kinds for Gas Works.
STEAM BOILERS and WATER TANKS of any size or description. SHAFTING, PULLIES and HANGERS.

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Locomotive & Machine
WORKS,
SUCCESSORS TO
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HAVING extensive facilities, are now prepared to furnish promptly of the best and most improved description, either
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LOCOMOTIVE ENGINES
AND OTHER VARIETIES OF
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44 Exchange Place, New York.

Locomotive Engines.
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HAVING erected an extensive Shop, with the most approved Machinery and Tools, are prepared to execute orders for the various classes of Freight and Passenger Locomotive Engines and Tenders, in the best manner and on the most favorable terms.

Also, Stationary Engines, and the various Tools suitable for furnishing Repair Shops.

The business of Machine making, heretofore carried on by Charles Danforth & Co., is continued by the present firm, and all orders will receive prompt attention. 1y49

THE SCHENECTADY
LOCOMOTIVE WORKS,
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HAVING large facilities, are prepared to receive and execute orders for

LOCOMOTIVE ENGINES AND TENDERS,

either for burning WOOD or COAL, with promptness and dispatch.

BRASS and IRON CASTINGS; LOCOMOTIVE TYRES welded and blocked to exact sizes, and every thing connected with the building or repairing of Locomotives furnished on short notice.

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